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No. _____

In the Supreme Court of the United States

NIK L. JOHNSTON AND JOHN P. BARDEEN,
Petitioners,

v.

JON DUDAS, ACTING DIRECTOR,
PATENT AND TRADEMARK OFFICE,
Respondent.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

PETITION FOR WRIT OF CERTIORARI

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QUESTIONS PRESENTED

1. Whether the Federal Circuit's approach to the patentability of structural printed matter disregards statutory subject matter as enacted by Congress.

2. Whether the Federal Circuit's approach to the patentability of structural printed matter undercuts this Court's decisions that the only prohibitions on patentable subject matter are laws of nature, natural phenomena and abstract ideas.

3. Whether the Federal Circuit's approach to the patentability of structural printed matter denies inventors potentially valuable patent rights.

4. Whether the Federal Circuit improperly refuses to give patentable weight to structural printed matter components of claims unless and only if there is a new and non-obvious functional relationship between the printed matter and the substrate.

5. Whether Federal Circuit law directed to printed matter is both in disarray and self-contradictory.

PARTIES TO THE PROCEEDING AND RULE 29.6 STATEMENT

Petitioners are: Nik L. Johnston, a Colorado resident, and John P. Bardeen, a Colorado resident. Nik L. Johnston and John P. Bardeen have formed Going For It, LLC, a Colorado limited liability company which is the real party in interest as assignee of the patent application in issue.

Respondent is the Director of the United States Patent and Trademark Office.

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PETITION FOR WRIT OF CERTIORARI

Petitioners, Nik L. Johnston and John P. Bardeen (jointly "Johnston et al"), respectfully petition for a writ of *certiorari* to review the judgment of the Court of Appeals for the Federal Circuit (the "Federal Circuit").

OPINIONS BELOW

The Notice of Entry of Judgment Without Opinion and the Judgment of the United States Court of Appeals for the Federal Circuit is reported at 2004 USApp Lexis 10848 (Fed. Cir. 2004), and is reproduced in Petitioners' Appendix (hereinafter "App.") at 1a-3a. The unpublished Decision on Appeal of the United States Patent and Trademark Office, Board of Patent Appeals and Interferences is reproduced in App. at 4a-12a.

JURISDICTION

The United States Court of Appeals for the Federal Circuit entered judgment on May 20, 2004. Petitioners invoke the jurisdiction of this Court pursuant to 28 U.S.C. § 1254(1).

STATUTE INVOLVED

35 U.S.C. § 101 of the Patent Laws of the United States provides as follows regarding patentable subject matter:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title.

STATEMENT OF THE CASE

The Invention and the Patent Application

Petitioners, Nik L. Johnston and John P. Bardeen ("Johnston et al"), conceived and reduced to practice a method for simulating the three-dimensional appearance of a golf ball on a two-dimensional substrate using a pattern of images. Various images can be employed in this pattern where each image is constructed according to a recited structure. The images themselves are organized in a matrix also having a defined structure. This method may be used to manufacture a two-dimensional article, such as fabric, wallpaper and the like, which will then give the desired illusion of a three-dimensional golf ball surface.

Johnston et al filed an application for patent on this article of manufacture and this method on January 28, 1999. This application is reproduced in App. at 13a-30a, and the figures 1-10 in this application, App. at 30a, illustrate the repeating geometric pattern and several exemplary images that may be used to create the pattern according to Johnston et al's invention. There is no specific design recited, but rather the claims of the application recite the physical structure of the images and the relationship of the images that can produce the desired result.

The patent application initially contained claims 1-30, including both article of manufacture claims and method claims. Generally, the article of manufacture claims called for a substrate material having a pattern disposed thereon as a matrix of individual images of a selected geometric shape spaced from one another in a defined geometric pattern and wherein each image had a decreasing ratio of printed and unprinted portions in a common direction. In several

embodiments, the individual images are themselves made of a pattern of individual distinct shapes. The method claims were directed to a method of producing this structural pattern.

The Actions of the Patent Examiner

Initially, the Examiner entered some fairly minor technical objections and a substantive rejection that the claims were obvious over an earlier patent (U.S. Patent No. 5,885,173 to Keller). The technical objections were corrected, and Johnston et al overcame the rejection based on the Keller patent disclosure. Nine (9) new claims (numbered 31-39) were added to the application. After this amendment, the Examiner entered new rejections that the claims were obvious over any of eight design patents. These patents are reproduced in App. at 31a-49a. While the Examiner admitted that these design patents did not show the claimed structural pattern, the Examiner held that Johnston et al's claims would be an obvious matter of design choice.

Johnston et al. again made minor amendments to some claims, canceled claims 35, 37 and 38, and added seven (7) new claims (numbered 40-46). In response to this amendment, the Examiner again rejected all of the claims on the eight design patents set forth above, and the rejection was made final.

The Decision of the Patent Office Board of Appeals and Interferences

Johnston et al appealed this rejection to the Board of Patent Appeals and Interferences (the "PTO Board"). Contemporaneously, Johnston et al filed an amendment after final to eliminate another minor technical rejection under 35 U.S.C. § 112 (second paragraph) which was entered to place

the claims in better condition for appeal to the PTO Board. The appealed claims are reproduced in App. at 50a-57a, and Claims 1 and 19 are illustrative:

> 1. An article of manufacture that provides an illusion of the dimpled exterior of a golf ball on a surface thereof, comprising:
>
> (a) a substrate material; and
>
> (b) a pattern disposed on said substrate material, said pattern formed by a plurality of similar images organized in a matrix, each of said images having a selected geometric shape with a center, said matrix having a plurality of rows of said images extending in a first direction wherein the images in each said row have centers that are aligned with one another, the center of each image in a selected row equidistantly spaced from the center of adjacent images in the selected row by a distance S which is greater than a longest dimension in the first direction of a longer one of said adjacent images in the first direction, and wherein each image includes printed and unprinted portions such that the ratio of printed to unprinted portions decreases in a primary direction.
>
> 19. A method of creating an illusion of the dimpled exterior of a golf ball on a surface, comprising the steps of:
>
> (a) providing an article of manufacture having a surface; and
>
> (b) disposing a plurality of similar images on said surface in spaced apart relation to one another, each

> said image having a selected geometric shape, and wherein each of said images is gradually shaded in a primary direction, said step of disposing including arranging the images into a pattern on the surface, wherein the center of a selected image is equidistantly spaced apart from the centers of adjacent images by a distance S which is greater than a dimension of one of said images in a selected direction.

In considering the appeal, the PTO Board observed that there was no dispute that the cited design patents taught or suggested "articles of manufacture and their method of creation responsive to all of the limitations in the appealed claims except for those in each claim defining a particular image ... ." App. at 9a. The PTO Board acknowledged that there were conceded differences between the claims and this prior art, such that the Examiner's conclusion that the claimed images would be obvious matters of design choice "was unfounded" and the rejection on this ground was a result of "hindsight knowledge impermissibly derived from the appellants' disclosure." App. at 9a. That is, if the structure of the printed images were given patentable weight, then the claims should be allowable.

Relying on authority of the United States Court of Appeals for the Federal Circuit (the "Federal Circuit"), the PTO Board refused to accord the recited structure of the geometrical images and the pattern any patentable weight since the images were placed on the substrate by some form of printing. The PTO Board summarized its opinion:

> [T]the argued differences between the appellants' invention and the prior art reside exclusively in the content of the printed matter images recited in the appealed claims. On the facts of this case and the legal

> guidance set forth in Gulack and Miller, these differences are not entitled to patentable weight because the printed matter and the substrate do not have a functional relationship, let alone a functional relationship which is new and unobvious. (Referring to *In re Gulack,* 703 F.2d 1381 (Fed. Cir. 1983) and *In re Miller,* 418 F.2d 1392 (CCPA 1969)).

App. at 11a-12a.

Since the PTO Board determined that no patentable weight should be accorded to the structural limitations contained within the printed matter, the Johnston et al claims were not allowable as a matter of law. The PTO Board did, however, conclude that then all claims would have been allowable over the references cited by the Examiner.

The Federal Circuit's Decision

Johnston et al appealed the PTO Board's decision to the Federal Circuit requesting that it follow the Supreme Court's directives on patentable subject matter and clarify the perimeters of the patentability of claims where printed matter is involved. The Federal Circuit declined to do so when it affimed the PTO Board by a judgment without opinion pursuant to Fed. Cir. R. 36. This judgment was entered on May 20, 2004.

Johnston et al suggest that the Federal Circuit has created an exception to the patentable subject matter of 35 U.S.C. § 101 that is not supported by the clear language of that statute. Moreover, this exception does not follow the directions of this Court in interpreting that statute. The unfortunate result is that the Federal Circuit, and the PTO Board in following the Federal Circuit, denies legitimate

patent protection intended by Congress to many inventors, like Johnston et al, whose inventions are implemented by a printing process.

REASONS FOR GRANTING THE PETITION

I. THIS COURT SHOULD PROVIDE GUIDANCE ON THE IMPORTANT ISSUE OF PATENTABLE SUBJECT MATTER

A patent is a valuable property right laden both with public interest and the interest of the patent holder or applicant for patent. Congress confers patents under the authority of Article I, § 8, cl. 8 of the Constitution, which provides that "The Congress shall have the power ... to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." Art. I, § 8, cl.8. Therefore, Congress may pass whatever laws it chooses with respect to patents provided only (1) that the laws provide protection for a limited time and (2) that the laws relate to discoveries by inventors.

At various times in the past, Congress has enacted legislation for the granting and enforcement of patents. Currently, we proceed under the Patent Act of 1952, 35 U.S.C. § 101 *et seq* (the "Patent Act"), which has, of course, been amended from time to time. As to the subject matter of patents, the Patent Act provides:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any improvement thereof, may obtain a

> patent therefore, subject to the conditions and requirements of this title.

35 U.S.C. § 101.

The starting point for the interpretation of any statute is the language of the statute itself. *Southwestern Community College v. Davis,* 442 U.S. 397, 405 (1979). "Unless otherwise defined, words will be interpreted as taking their ordinary, contemporary common meaning." *Perrin v. United States,* 444 U.S. 37, 42 (1979). Moreover, courts "should not read into the patent laws limitations and conditions which the legislature has not expressed." *Diamond v. Chakrabarty,* 447 U.S. 303, 308 (citing *United States v. Dubilier Condensor Corp.,* 289 U.S. 178, 199 (1933)).

The plain language of § 101 as enacted is inclusive in nature and is not drafted to exclude; that is, Congress did not exclude any category of subject matter. Indeed, "[t]he Committee Reports accompanying the 1952 Act inform us that Congress intended statutory subject matter to 'include anything under the sun that is made by man.'" *Chakrabarty,* 447 U.S. at 309 (citing S.Rpt. No. 1979, 82d Cong., 2d Sess., 5 (1952); H. Rep. No. 1923, 82d Cong., 2d Sess., 6 (1952)). Accordingly, patentable subject matter has been held to encompass numerous technologies unanticipated in 1952, including computerized systems, *Diamond v. Diehr,* 450 U.S. 175 (1980), genetically engineered microorganisms, *Chakrabarty , supra,* and business systems, *State Street Bank & Trust Co v. Signature Financial Group, Inc.,* 149 F.3d 1368 (Fed. Cir. 1998)(wherein historically rejected subject matter (business systems) was deemed to be patentable).

There are limits to the subject matter of what can be patented, and this Court has repeatedly identified the only

excluded subject matters to be "laws of nature, natural phenomena, and abstract ideas." *Diamond v. Diehr,* 450 U.S. 175, 182 (1981). By way of example, laws of nature include such things as the law of gravity. Natural phenomena include things such as discovered minerals. Abstract ideas include things such as mathematical algorithms. But there are these three, and only these three, categories of subject matter that are unpatentable. Printed matter is not a fourth category excluded by this Court. *See, In re Alappat,* 33 F.3d 1526, 1543 (Fed. Cir. 1994)(Mathematical concepts are not a fourth excluded concept).

Under this Court's rationale that only laws of nature, natural phenomena, and abstract ideas are not patentable, there are times when claims that involve printed elements should not be patentable, namely, when the printed matter is an attempt to patent an abstract idea or a law of nature. There are other significant times when claims that involve printed elements should be patentable, namely, when the printed matter is structure that does not attempt to preempt an abstract idea or a law of nature.

Understanding and clarifying such distinction is increasingly important where the technology of printing has become advanced and versatile. Printing is used in diverse fields such as the manufacture of integrated circuits, computer data structures and prototype fabrication, to name a few. It is important that this Court guide inventors and patent drafters of the perimeters of patentable subject matter where structural elements are derived by a printing process. This Court should take such opportunity because the Federal Circuit has not articulated a correct dividing line between patentable and unpatentable printed matter.

II. THIS COURT HAS NEVER SPECIFICALLY ADDRESSED THE ISSUE OF THE RELATION OF PRINTED MATTER TO PATENTABILITY

This Court has never specifically addressed printed matter as an issue in patent claims. Where the lower courts and the Patent Office misapply both § 101 of the Patent Act the statute and this Court's interpretation of § 101, it is important to give a direct ruling on this issue. Unless this Court reviews the decision below, an increasingly large number of patent applicants, including Johnston et al, will continue to have their legitimate rights denied. There is no other possible relief unless Congress acts in the future on this issue. Until Congress acts, this Court needs to ensure proper interpretation and implementation of the statute.

Although Johnston et al have not located any opinion of this Court that is directly on the issue of printed matter, this Court has considered what is excluded under the categories of laws of nature, natural phenomena and abstract ideas. With respect to laws of nature and natural phenomena, the Court explained:

> "Thus, a new mineral discovered in the earth or a new plant found in the wild is not patentable subject matter. Likewise, Einstein could not patent his celebrated law that $E=mc^2$; nor could Newton have patented the law of gravity. Such discoveries are 'manifestations of ... nature, free to all men and reserved exclusively to none'."

Chakrabarty, 447 U.S. at 309 (citing *Funk Bros. Seed v. Kalo Inoculant,* 333 U.S. 127, 130 (1948)).

This Court also has had the opportunity to address the meaning of "abstract idea". For example, in *Le Roy v. Tatham,* 14 How.156, 175 (1853), the Court stated "a principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right." This rule was followed in *Rubber-Tip Pencil Co. v. Howard,* 20 Wall. 498 (1874) where the Court reaffirmed that "[a]n idea of itself is not patentable, but a new device by which it may be made practically useful is." *Id.* at 507.

In *Diamond v. Diehr, supra,* this Court reviewed the patentability of a process for molding raw, uncured synthetic rubber into cured products using an abstract mathematical formula (the Arrhenius equation) to open the press and remove the cured product. Here, in the majority opinion by Justice Rehnquist, the Court observed:

> We recognize, of course, that when a claim recites a mathematical formula (or scientific principle or phenomenon of nature), an inquiry must be made into whether the claim is seeking patent protection for that formula in the abstract. A mathematical formula as such is not accorded the protection of our patent laws, ...

Diehr, 450 U.S. 175, 191 (*citing Gottschalk v. Benson,* 409 U.S. 63 (1972)).

The concept of abstract ideas is based upon an earlier line of cases that found claims unpatentable under the "mental steps" doctrine. The dissent by Justice Stevens in *Diehr* recognized the historical significance:

> Prior to 1968, well-established principles of patent law probably would have prevented the issuance of a valid patent on almost any conceivable computer program. Under the "mental steps" doctrine, processes involving mental operations were considered unpatentable [*citing cases*]. The mental-steps doctrine was based upon the familiar principle that a scientific concept or a mere idea cannot be the subject of a valid patent. [*citing case*]. The doctrine was regularly invoked to deny patents to inventions consisting primarily of mathematical formulae or methods of computation. It was also applied against patent claims in which a mental operation or mathematical computation was the sole novel element or inventive contribution; it was clear that patentability could not be predicated upon a mental step.

Id. at 195-196.

Both the majority and the dissenting minority in *Diehr* therefore were consistent on the issue that ideas in the abstract cannot be protected. Accordingly, in a patent claim containing an element derived by printing, the question of whether the claim is patentable subject matter should be resolved by determining if the applicant seeks to patent an idea in the abstract.

Johnston et al do not here seek a utility patent on the abstract idea of placing the image of a golf ball on a surface substrate. Rather, Johnston et al seek a utility patent for a structural pattern constituting similar images organized and maintained in a specifically structured geometrical matrix by a substrate so as to have a defined structural relation to one another. The result of this structural pattern is to make the substrate have the appearance of a golf ball surface, but the

claims do not preempt the ability of others to simulate the appearance of a golf ball with other patterns—the claims do not preempt the idea.

III. THE FEDERAL CIRCUIT AND THE PTO BOARD DEPART FROM THIS COURT'S PRECENDENT AND THEIR APPROACH IS CONTRARY TO § 101 OF THE PATENT ACT

When considering claims in patent application where printed matter is recited, the approach taken by the Federal Circuit simply ignores legislative intent and this Court's precedents. It begins with the premise, not contained within any of this Court's precedent, that "printed matter by itself is not patentable subject matter, because non-statutory, ..." *In re Miller*, 418 F. 2d 1392, 1396 (CCPA 1969)(emphasis added). The Federal Circuit (and the PTO Board in following the Federal Circuit) fails to examine such printed matter claims to determine whether the printed matter seeks to claim a natural phenomena, a law of nature or an abstract idea.

This approach unfortunately leads to difficulty because the Federal Circuit long has recognized that oftentimes claims that recite printed matter should be accorded patent protection. In response to its own misconstruction of § 101, the Federal Circuit, and its predecessor Court of Customs and Patent Appeals, thus created a judicial "exception" to its own rule. This exception is known as the "functional relationship" exception, and it holds that the printed matter should be considered as part of the claim for purposes of analyzing the claim under the novelty and non-obviousness tests of the Patent Act but only when and if there is a functional relationship between the printed matter and its substrate. As stated in *Miller*:

> The fact that printed matter by itself is not patentable subject matter, because non-statutory, is no reason for ignoring it when the claim is directed to a combination. Here there is a new an unobvious functional relationship between a measuring receptacle, volumetric indicia thereon indication volume in a certain ratio to actual volume, and a legend indicating the ratio ... ."

418 F. 2d at 1396.

This approach was adopted by the Federal Circuit in *In re Gulack*, 703 F.2d 1381 (Fed. Cir. 1983) wherein the Federal Circuit held, "[w]here the printed matter is not functionally related to the substrate, the printed matter will not distinguish the invention from the prior art in terms of patentability." *Id.* at 1385.

The PTO Board simply followed this erroneous approach with respect to Johnston et al's invention, stating:

> [T]he argued differences between the appellants' invention and the prior art reside exclusively in the content of the printed matter images recited in the appealed claims. On the facts of this case and the legal guidance set forth in Gulack and Miller, these differences are not entitled to patentable weight because the printed matter and the substrate do not have a functional relationship, let alone a functional relationship which is new and unobvious." (Referring to *In re Gulack,* 703 F.2d 1381 (Fed. Cir. 1983) and *In re Miller,* 418 F.2d 1392 (CCPA 1969)).

App. at 11a-12a.

The starting point of a patentability analysis should not be "printed matter is non-statutory" because Congress did not exclude printed matter nor has this Court excluded printed matter as unpatentable. If printed matter in any patent application's claims is to be excluded from the realm of patentability, that exclusion must be premised on the prohibition against patenting abstract ideas. Structural printed matter simply is neither a law of nature nor a natural phenomenon.

Accordingly it would follow that the thrust of any inquiry regarding patentability hence becomes whether the claim as a whole, including the printed matter, is an attempt to preempt an abstract idea, *i.e.*, an idea conveyed to the intelligent mind by the printed matter. This would be no different than that line of cases holding that claims including mathematical algorithms are patentable unless there is an attempt to preempt the use of the algorithm in the abstract. *See, e.g., Diamond v. Diehr,* 450 U.S. 175 (1980); *In re Alappat,* 33 F.3d 1526 (Fed. Cir. 1994).

As to analogous mathematical algorithms, the Federal Circuit has already ruled "unpatentable mathematical algorithms are identifiable by showing they are merely abstract ideas constituting disembodied concepts, ..." *AT&T Corp. v. Excel Communications, Inc.,* 172 F.3d 1352, 1357 (Fed. Cir. 1999)(quoting *State Street Bank & Trust Co. v. Signature Financial Group, Inc.,* 149 F.3d 1368, 1373 (Fed. Cir. 1999)). So too, unpatentable printed matter should be that which is merely an abstract idea constituting a disembodied concept. But this is not how the Federal Circuit or the PTO Board currently operate when they say that printed matter is "not statutory subject matter".

IV. FEDERAL CASE LAW REGARDING PRINTED MATTER IN PATENT CLAIMS IS IN DISARRAY

In addition, the Federal Circuit case law is in disarray when elements of patent claims concern printed matter. Prior to *Gulack, supra,* the predecessor Court of Customs and Patent Appeals ("CCPA") appeared to be following the abstract idea analysis articulated by this Court. In *In re Jones,* 373 F.2d 1007 (CCPA 1967), the CCPA considered an invention of a code disc for angular position encoders. The disc was simply a transparent substrate that contained printed and unprinted areas. A deliberate introduction of a half-quantum error was introduced in the printed pattern so as to eliminate possible ambiguities and give high accuracy. The PTO Board had rejected the claims as "printed matter". The CCPA reversed, stating:

> That claim, and the others likewise, do not in our opinion, define "printed matter' in the sense in which that term has heretofore been used to indicate various sorts of indicia whose primary purpose is the conveying of intelligence to a reader. What we find on the disc we would not characterize as indicia or printing but as structure, albeit the 'pattern areas' of claim 1 are not necessarily transparent and opaque, respectively, and might be produced by some sort of printing technique.

Jones, 373 F.2d at 1012 (emphasis added).

Further:

> Certainly there is no "printing" in this case in the form of words or other symbols intended to convey

> intelligence to a reader nor in the form of rulings as on a business form. The user of the disc is not supposed to contemplate it as he would a mathematical table, weight scale chart, or the like in order to derive some information.

Id. at 1014.

Two years later, in *In re Miller, supra,* the CCPA made the surprising leap from *Jones* to the omnibus statement that "printed matter by itself is not patentable subject matter, because non-statutory ... ." *Miller,* 418 F.2d at 1396. This was just shortly before the line of computer cases from this Court, beginning with *Gottschalk v. Benson,* 409 U.S. 63 (1972), wherein this Court consistently reiterated that the only exceptions to § 101 of the Patent Act are abstract ideas, laws of nature and natural phenomena.

Five years after *Miller,* the CCPA was back to the rule that printed matter could be structural. In *In re Royka,* 490 F.2d 981 (CCPA 1974) a patent claim was to a printed substrate. "Meaningful" information was printed in permanent ink and "confusing" information was printed in removable ink. The user could then make a selection and attempt removal. The approach here applied by the CCPA was that "[p]rinted matter may very well constitute structural limitations upon which patentability may be predicated." *Royka,* 490 F.2d at 985 (citing *In re Jones*).

Nonetheless, the Federal Circuit subsequently chose again to disregard the *Jones* and *Royka* in favor of the *Miller* approach. *In re Gulack, supra,* again holding that printed matter was unpatentable unless there is a functional relationship to the substrate upon which it was printed. The Federal Circuit's rule is that printed matter as non-statutory

subject matter is excluded from consideration under the tests of novelty (§ 102) and non-obviousness (§ 103):

> If, instead, the [PTO Board] sought only to construe and apply *Miller* with the context of a section 103 rejection, we find no error in the board's articulation of the law. Where the printed matter is not functionally related to the substrate, the printed matter will not distinguish the invention from the prior art in terms of patentability.

Gulack, 703 F.2d at 1395.

In a footnote to this passage, though, the Federal Circuit seemed to question its own approach, stating:

> A "printed matter" rejection under § 103 stands on questionable legal and logical footing. Standing alone, the description of an element of the invention as printed matter tells nothing about the differences between the invention and the prior art or about whether that invention was suggested by the prior art. A printed matter rejection is based on case law antedating the 1952 patent act, employing a point of novelty approach.

Gulack, 703 F.2d at 1385, n.8.

The *Gulack* case is additionally interesting for the invention was simple. The Federal Circuit characterized it as follows:

> The appealed claims recite three key elements: (1) a *band,* ring, or set of concentric rings; (2) a plurality of individual *digits* imprinted on the band or ring at

> regularly spaced intervals; and (3) an *algorithm* by which the appropriate digits are developed.

Gulack, 703 F.2d at 1382.

The Federal Circuit in *Gulack* reversed the PTO Board's rejection of the claims but struggled to find a functional relationship between the printed matter and the substrate. The relationship was thought to be twofold. "The band supports the sequence of digits and it presents the digits as an endless sequence with no discrete beginning or end." *Id.* at 1382. In point of fact, however, the substrate did not have to be a closed band. The claim actually recited "at least one band which is endless *or adapted to have ends fastened to form an endless band* ...." 703 F.2d at 1383 (emphasis added). Therefore, the digits could have simply been printed on a strip of paper so that the only relationship, as with all printed matter, was that the substrate supported the digits.

In 1994, the Federal Circuit criticized the PTO Board in its attempt to extend the printed matter cases to information stored in data storage considered an invention related to "the storage, use, and management of information residing in a memory" and provided "an efficient, flexible method of organizing stored data in a computer memory." *In re Lowry*, 32 F.3d 1579, 1580 (Fed. Cir. 1994). The Federal Circuit expressly characterized the printed matter cases and said, "The printed matter cases 'dealt with claims defining as the invention certain novel arrangement of printed lines or characters, useful and intelligible only to the human mind.'" *Id.* at 1583 (citing *In re Bernhart*, 417 F.2d 1395, 1399 (CCPA 1969)). This sounds like a reversion to the concept of abstract idea.

Yet this year (2004) the Federal Circuit once more endorsed the *Gulack* rule that where the printed matter is not functionally related to the substrate, the printed matter will not distinguish the invention from the prior art in terms of patentability. *In re Ngai,* 367 F.3d 1336 (Fed. Cir. 2004). And, of course, in the present matter, the Federal Circuit affirmed without opinion the PTO Board's decision that Johnston et al's claims are not patentable "because the printed matter and the substrate do not have a functional relationship, let alone a functional relationship which is new and unobvious." App. at 12a.

This disarray leaves inventors and patent drafters in a dilemma over what standard their invention will be measured. Will it be the rule that the printed matter is acceptable unless the claim is for an abstract idea intelligible only to the human mind or will it be that claims is rejected unless the applicant can demonstrate a new and non-obvious function relationship to the substrate?

Johnston et al's claims clearly recite structural elements that have nothing to do with protecting an abstract idea that is intelligible only to the human mind. Therefore, the present matter presents the ideal opportunity to correct the historic disarray in the printed matter decisions and direct the lower courts to abide by the precedents of this Court.

CONCLUSION

The petition for writ of certiorari should be granted for the foregoing reasons.

Respectfully Submitted,

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APPENDIX A

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

No. 03-1554

[Entered May 20, 2004]

In re Johnston

NOTICE OF ENTRY OF
JUDGMENT WITHOUT OPINION

The judgment of the court in your case was entered today pursuant to Rule 36. This Court affirmed the judgment or decision that was appealed. None of the relief sought in the appeal was granted. No opinion accompanied the judgment. The mandate will be issued in due course.

Information is also provided about petitions for rehearing and suggestions for rehearing in banc. The questions and answers are those frequently asked and answered by the Clerk's Office.

Regarding exhibits and visual aids: Your attention is directed to FRAP 34(g) which states that the clerk may destroy or dispose of the exhibts if counsel does not reclaim them within a reasonable time after the clerk gives notice to

remove them. (The clerk deems a reasonable time to be 15 days from the date the final mandate is issued.)

/s/_____
Jan Horbaly
Clerk

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

No. 03-1554
(Serial No. 09/239,359)

[Filed May 20, 2004]

IN RE NIK L. JOHNSTON AND JOHN P. BARDEEN

JUDGMENT

ON APPEAL from the UNITED STATES PATENT AND TRADEMARK OFFICE, BOARD OF PATENT APPEALS AND INTERFERENCES

This CAUSE having been heard and considered, it is ORDERED and ADJUDGED:

Per Curiam (SCHALL, GAJARSA, and DYK, Circuit Judges).

AFFIRMED: See Fed. Cir. R. 36.

ENTERED BY ORDER OF THE COURT

DATED May 20 2004 /s/_____
Jan Horbaly
Clerk

APPENDIX B

Paper No. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte NIK L. JOHNSTON and JOHN P. BARDEEN

Appeal No. 2002-2253
Application 09/239,359

ON BRIEF

Before ABRAMS, FRANKFORT, and MCQUADE, Administrative Patent Judges.

MCQUADE, Administrative Patent Judge.

DECISION ON APPEAL

Nik L. Johnston et al. appeal from the final rejection (Paper No. 12) of claims 1 through 34, 36 and 39 through 46, all of the claims pending in the application.[1]

[1] Claims 40 and 41 have been amended subsequent to final rejection.

THE INVENTION

The invention relates to "articles of manufacture having a pattern thereon which provides the illusion of the dimpled surface of a golf ball . . . [and] a method of creating an illusion of the dimpled exterior of a golf ball on a surface" (specification, page 1). The articles of manufacture, exemplified in the appellants' specification by a golf shirt 10, comprise a substrate which can be made from a variety of materials including fabric, paper, plastic, metal and wood (see, for example, pages 5 and 8 in the specification). The pattern comprises images composed of printed and unprinted portions on the substrate with the printed portions formed by techniques such as wet-printing, silk-screening and fabric-weaving (see, for example, pages 3, 4 8 and 10 in the specification).

Representative claims 1 and 19 read as follows:

1. An article of manufacture that provided an illusion of the dimpled exterior of a golf ball on a surface thereof, comprising:

(a) a substrate material; and

(b) a pattern disposed on said substrate material, said pattern formed by a plurality of similar images organized in a matrix, each of said images having a selected geometric shape with a center, said matrix having a plurality of rows of said images extending in a first direction wherein the images in each said row have centers that are aligned with one another, the center of each image in a selected row equidistantly spaced from the center of adjacent images in the selected row by a distance S which is greater than a longest dimension in the first direction of a longer one of said adjacent images in the first direction, and

wherein each image includes printed and unprinted portions such that the ratio of printed to unprinted portions decreases in a primary direction.

19. A method of creating an illusion of the dimpled exterior of a golf ball on a surface, comprising the steps of:

(a) providing an article of manufacture having a surface; and

(b) disposing a plurality of similar images on said surface in spaced apart relation to one another, each said image having a selected geometric shape, and wherein each of said images is gradually shaded in a primary direction, said step of disposing including arranging the images into a pattern on the surface, wherein the center of a selected image is equidistantly spaced apart from the centers of adjacent images by a distance S which is greater than a dimension of one of said images in a selected direction.

THE PRIOR ART

The references relied on by the examiner to support the final rejection are:

Towne	Des. 23,408	Jul. 3, 1894
Block	Des. 32,265	Feb. 20, 1900
Becker	Des. 41,502	Jun. 20, 1911
Friedlander	Des. 58,743	Aug. 30, 1921
Vandergaw et al. (Vandergaw '880)		
	Des. 65,880	Oct. 28, 1924
Vandergaw et al. (Vandergaw '156)		
	Des. 66,156	Dec. 2, 1924
Green	Des. 126,473	Apr. 8, 1941
Bergin	Des. 429,894	Aug. 29, 2000

THE REJECTION

Claims 1 through 34, 36 and 39 through 46 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Towne, Block, Becker, Friedlander, Vandergaw '880, Vandergaw '156, Green and Bergin.

Attention is directed to the appellants' main and reply briefs (paper Nos. 16 and 19) and to the examiner's answer (Paper No. 18) for the respective positions of the appellants and the examiner regarding the merits of this rejection.[2]

DISCUSSION

I. The form of the examiner's rejection

The appellants criticize, with some justification, the manner in which the examiner has formulated the rejection. For example, the appellants contend that "the Examiner has not articulated which of the eight individual references are specifically applied to reject individual claims or groups of claims, or how those references are being modified or combined to make the rejections" (main brief, page 6), that "the Examiner has entered a blanket obviousness rejection of all claims over the various eight design patents cited, without addressing the merits of any individual claims or applying any specific references to those claims" (main brief, pages 7 and 8), and that

---

[2] In the final rejection, claims 40 and 41 also stood rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The examiner has since withdrawn this rejection in view of the amendments made subsequent to final rejection (see n.1, supra).

> the Examiner has both declined to give patentable weight to all of the claimed elements (which the Examiner appears to unanimously characterize as "printed matter"), and has failed to state how the Examiner's position is supported by the cited cases (which clearly state, contrary to the Examiner's position, that "printed matter" elements may be entitled to patentable weight) [main brief, page 8].

A review of the examiner's position shows that while the rejection could have been more clearly explained, the appellants' criticisms are overstated.

The examiner's discussion of the references indicates that they are applied collectively to show the state of the relevant prior art, i.e., articles of manufacture comprising a substrate material having images thereon, and the implied method of creating such articles. In this regard, Towne discloses wrapping paper, Block discloses an open-mesh fabric for veils and hat trimmings, Becker discloses wall paper, Friedlander discloses a cotton tent fabric, Vandergaw '880 and Vandergaw '156 disclose flocked voiles, Green discloses a woven cellophane and cotton fabric, and Bergin discloses an awning fabric. Each of these articles of manufacture comprises a material substrate bearing ornamental images.

The explanation of the rejection also indicates that the examiner considers the state of the relevant prior art established by the references as responding to all of the limitations in the appealed claims except for those in each claim defining the particular content of the images. As for these differences, the examiner takes alternative approaches (see pages 3 through 5 in the answer). First, the examiner concludes that the recited images would have been obvious matters of design choice. Second, the examiner characterizes

the recited images as printed matter and, citing In re Gulack, 703 F.2d 1381, 217 USPQ 401 (Fed. Cir. 1983), concludes that the claim limitations relating thereto are not entitled to patentable weight.

II. The substance of the examiner's rejection

The determination by the examiner that the applied prior art teaches or suggests articles of manufacture and their method of creation responsive to all of the limitations in the appealed claims except for those in each claim defining a particular image is reasonable on its face, and has not been disputed by the appellants.

As for the conceded differences between the claimed subject matter and the prior art, the examiner's conclusion that the images recited in the claims would have been obvious matters of design choice in view of the prior art images is unfounded. The examiner has not advanced any evidence to this effect, and it would appear that the only suggestion for modifying the prior art images to arrive at those set forth in the claims stems from hindsight knowledge impermissibly derived from the appellants' disclosure.

On the other hand, the examiner's alternative conclusion that the image limitations in the claims pertain to printed matter not entitled to patentable weight is well taken under the facts of this case and the current state of the law.

Printed matter in this context refers to various sorts of printed indicia, words, characters or other symbols whose primary purpose is to convey intelligence to a human mind. See In re Lowry, 32 F.3d 1579, 1583, 32 USPQ2d 1031, 1034 (Fed. Cir. 1994); In re Jones, 373 F.2d 1007, 1012, 153 USPQ 77, 80-81 (CCPA 1967). As disclosed and claimed by

the appellants, the images set forth in the appealed claims embody printed indicia, characters and/or symbols which create an illusion of the dimpled exterior of a golf ball. The appellants' specification confirms that the object of the images is to provide "items which are aesthetically pleasing to those *persons* who enjoy the game of golf" (page 3). Thus, the appellants' printed images are intended to convey to human minds aesthetically pleasing information, i.e., "intelligence," in the form of an illusion of the dimpled exterior of a golf ball. Given this purpose, and notwithstanding the appellants' arguments to the contrary, the images recited in the appealed claims fall squarely within the above definition of printed matter. The attempt by the appellants (see, for example, page 3 in the reply brief) to liken the recited images to printed structure of the sort at issue in In re Jones, supra, is not well taken. In that case, the court found the subject printed elements to be "structure" designed to interact with a machine, rather than indicia intended to convey intelligence to a human reader. The printed images set forth in the appellant's claims embrace no such "structure."

The mere fact that the images recited in the appellant's claims constitute printed matter, however, is not dispositive of the merits of the appealed rejection.

Differences between an invention and the prior art cannot be ignored merely because those differences reside in the content of printed matter. In re Lowry, supra, 32 F.3d at 1583, 32 USPQ2d at 1034; In re Gulack, supra, 703 F.2d at 1385, 217 USPQ at 403; In re Miller, 418 F.2d 1392, 1396, 164 USPQ 46, 49 (CCPA 1969). Where the printed matter is not functionally related to the substrate, the printed matter will not distinguish the invention from the prior art in terms of patentability. Although the printed matter must be considered, in that situation it may not be entitled to

patentable weight. What is required is the existence of differences between the claims and the prior art sufficient to establish patentability. The bare presence or absence of a specific functional relationship, without further analysis, is not dispositive of obviousness. Rather, the critical question is whether there exists any new and unobvious functional relationship between the printed matter and the substrate. In re Gulack, supra, 703 F.2d at 1385, 217 USPQ at 404. Also, see In re Miller, supra, 418 F.2d at 1395-96, 164 USPQ at 48-49.

In the present case, there is no functional relationship between the printed matter images and the substrate material defined in the appealed claims. The only relationship between the two is a simple structural one wherein the substrate material provides the surface on which the images are printed. The generic limitations in the claims relating to the article of manufacture and the substrate material highlight this exclusively structural relationship. The appellants' effort (see, for example, page 26 in the main brief) to favorably compare the relationship to the functional relationships found in Miller and Gulack is unconvincing. Miller involved printed measuring indicia on a measuring receptacle substrate and Gulack involved a printed endless sequence of uniquely positioned digits on an endless band substrate. In contrast, the appellants' claims pertain to printed images on a substrate material in an unspecified article of manufacture. The only relationship of note in the appellants' invention is between the printed components of the images defined in the claims. This relationship, however, pertains solely to the content of the images and the visual effect conveyed thereby to an observer.

To summarize, the argued differences between the appellants' invention and the prior art reside exclusively in the content of the printed matter images recited in the appealed

claims. On the facts of this case and the legal guidance set forth in Gulack and Miller, these differences are not entitled to patentable weight because the printed matter and the substrate do not have a functional relationship, let alone a functional relationship which is new and unobvious.

Accordingly, we shall sustain the standing 35 U.S.C. § 103(a) rejection of claims 1 through 34, 36 and 39 through 46 as being unpatentable over Towne, Block, Becker, Friedlander, Vandergaw '880, Vandergaw '156, Green and Bergin.

SUMMARY

The decision of the examiner to reject claims 1 through 34, 36 and 39 through 46 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

/s/_____ NEAL E. ABRAMS Administrative Patent Judge	)
/s/_____ CHARLES E. FRANKFORT Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
/s/_____ JOHN P. MCQUADE Administrative Patent Judge	)

APPENDIX C

PATENT APPLICATION

ARTICLE OF MANUFACTURE HAVING ILLUSION OF DIMPLED GOLF BALL SURFACE AND METHOD OF CREATING THE SAME

FIELD OF THE INVENTION

The present invention is broadly directed to articles of manufacture, but is more particularly directed to articles of manufacture having a pattern thereon which provides the illusion of the dimpled surface of a golf ball. The present invention is also directed to a method of creating an illusion of the dimpled exterior of a golf ball on a surface.

BACKGROUND OF THE INVENTION

The game of golf is widely popular throughout the world. From its origins in Scotland, golf has spread to numerous countries and has become the favored pastime of a large community of golfers. Numerous golf courses have been designed and built throughout the United States and other countries, and such courses are often heavily frequented.

The popularity of the game of golf has resulted in the spin-off of commercial products relating to, signifying, and endorsing the game. Those persons who enjoy the game often desire to wear items signifying or relating to golf. Further, persons who enjoy golf often desire utilitarian products which demonstrate signifiers relating to the game. Numerous

utilitarian products and fashion items have been designed with the game of golf in mind. Hats, shirts, jackets, golf bags, umbrellas and towels are just a few of the many items which may be produced to include logos and references to golf-related signifiers.

One particular signifier of the game of golf is the dimple pattern of golf balls. Dimple patterns come in many shapes and sizes. Many are designed to improve a golf ball's flight characteristics when struck with a golf club during the game. Given the association ofthe dimpled pattern of a golf ball with the game of golf, it is desirable to create commercial items incorporating such a pattern thereon. However, because the dimple pattern appears on the three-dimensional surface of a golf ball, it is difficult to replicate such a pattern on a two-dimensional surface of an article of manufacture.

Further, it is difficult to replicate the manner in which light shining on a golf ball creates a shadow gradient in the dimples of a golf ball. It may be observed that those parts of the dimples of a golf ball which are unexposed to a light shining on the golf ball will display a shadow in the concavity of the dimple portion of the golf ball. That shadow will gradually fade away from that portion of the golf ball which is directly exposed to the source of the light, due to the spherical shape of the golf ball.

Accordingly, it is desirable to provide a method for forming the illusion of the dimpled surface of a golf ball on a surface, and to provide articles of manufacture displaying such an illusion of the dimpled surface of a golf ball on a surface. There is a need in the industry for an efficient, simple method for incorporating the dimpled pattern of golf balls into commercial items. The present invention is directed to meeting these needs.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an article of manufacture displaying thereon the illusion of the dimpled pattern of the surface of a golf ball.

It is a further object of the present invention to provide a method of creating an illusion of the dimpled exterior of a golf ball on a surface.

It is still a further object of the present invention to provide an article of manufacture having a pattern of the dimpled surface of a golf ball thereon which can be formed simply and efficiently by common manufacturing techniques.

It is another object of the present invention to provide commercial items which are aesthetically pleasing to those persons who enjoy the game of golf.

According to the present invention, then, an article of manufacture comprises a substrate material and a pattern disposed on the substrate material. The pattern is formed by a plurality of similar images organized in a matrix. Each image has a selected geometric shape with a center. The matrix has a plurality of rows of said images extending in a first direction, wherein the images in each row have centers that are aligned with one another. The center of each image in a selected row is equidistantly spaced from the center of an adjacent image in the selected row by a distance S which is greater than a dimension of one of the images in the first direction. Each image includes printed and unprinted portions such that the ratio of printed to unprinted portions in each image decreases in a common primary direction.

Rows of images may be offset from each other such that a first axis perpendicular to the first direction and passing through the center of a selected image in a row is offset by a distance S/2 from a second axis perpendicular to the first direction and passing through the center of an image in an adjacent row. The images may be a geometric shape selected from a group consisting of a circle, an oval, an ellipse, and polygons having N sides, wherein N is greater than or equal to 3.

So as to provide the illusion of a shadow gradient across each of the images in the primary direction, the images are gradually shaded by several varieties of printed portions which may be equidistantly spaced apart within the image. One embodiment includes printed portions, which may be circular, wherein the size of the printed portions gradually decreases in the primary direction. In another embodiment, printed portions are equidistantly spaced bands having a band height measured in the primary direction, wherein the bands diminish in height progressively in the primary direction. In a further embodiment, the bands taper in the primary direction. The bands may be oriented perpendicular or parallel to the primary direction. Preferably, the printed portions are colored a color darker than the color of the substrate material, although the printed portions may be lighter in color than the substrate material. The printed portions may be formed on the substrate material by techniques such as wet-printing, silk-screening, or fabric-weaving, although other techniques are contemplated.

The primary direction may be oriented at an angle, including perpendicular, with respect to the first direction. Alternatively, the primary direction may be parallel with respect to the first direction. Each image further includes a boundary therearound which may be continous such that the

entire boundary is visible, or which may be discontinous such that all or portions of the boundary are not visible.

The substrate material is selected from a variety of materials, including fabric, paper, plastic, metal and wood. Other materials as understood by the ordinarily skilled artisan are contemplated, including flexible materials.

Also according to the present invention, a method of creating an illusion of the dimpled exterior of a golf ball on a surface is provided. The method comprises the steps of providing an article of manufacture having a surface, and disposing a plurality of similar images on the surface. Each image has a selected geometric shape, such as a circle, and each image is gradually shaded in a primary direction. The gradual shading may result from a plurality of printed and unprinted portions where the ratio of printed to unprinted portions progressively decreases in the primary direction. Such printed and unprinted portions may include a graduated dot pattern or a thick-to-thin linear pattern. The step of disposing includes arranging the images into a pattern on the surface wherein the center of a selected image is equidistantly spaced apart from the centers of adjacent images by a distance S. The distance S is greater than a dimension of one of the images in a selected direction.

The present invention further includes an article of manufacture comprising a substrate material and an array of similar images distributed on the substrate material, each image having a selected geometric shape. Each image further includes printed and unprinted portions whereby the ratio of printed to unprinted portions in each image decreases in a primary direction. The images may be uniformly distributed on the substrate material, the array may include a row of images, or the images may be distributed such that a line

connecting the centers of three adjacent images form an equilateral triangle. The images may further be distributed on the substrate material thereby to simulate a dimple pattern of a selected golf ball. In addition, the size and geometric shape of the images may vary within the array such that a selected image has a size different from the size of an adjacent image, or a selected image has a geometric shape different from the geometric shape of an adjacent image.

These and other objects of the present invention will become more readily appreciated and understood from a consideration of the following detailed description of the exemplary embodiment(s) when taken together with the accompanying drawings, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of a person wearing an article of manufacture according to a first exemplary embodiment of the present invention;

Figure 2 is a perspective view of a section of substrate material and images according to the first exemplary embodiment of the present invention;

Figure 3 is a top plan view diagramming a section of substrate material having a pattern according to the present invention;

Figure 4 is a top plan view of an image according to the first exemplary embodiment of the present invention;

Figure 5 is a top plan view of a second exemplary image of the present invention;

Figure 6 is a top plan view of a third exemplary image of the present invention;

Figure 7 is a top plan view of a fourth exemplary image of the present invention;

Figure 8 is a top plan view of a fifth exemplary image of the present invention;

Figure 9 is a top plan view of a section of substrate material having a pattern according to a second exemplary embodiment of the present invention; and

Figure 10 is a top plan view of a section of substrate material having a pattern according to a third exemplary embodiment of the present invention.

DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

The present invention is directed to an article of manufacture and, in particular, an article of manufacture having a pattern thereon which creates the illusion of the dimpled exterior of a golf ball. Broadly, the invention includes a substrate material and a pattern thereon formed by a plurality of similar images. An important feature of this invention is the pattern of images which simulate the positioning of the dimples on a golf ball, and the gradual shading of the images in a primary direction to simulate the shading of light directed across the dimples of a golf ball. The present invention is also directed to a method for simulating on a surface the dimpled exterior of a golf ball. It should be understood that patterns, image shapes, and shading variations other than those described herein are within the scope of this invention.

With reference, then, to Figure 1, a first exemplary embodiment of the present invention is shown as an article of manufacture 10, in this case a shirt which can be worn by a golfer 12. Article of manufacture 10 has substrate material 20 which is shown as a flexible fabric. It should be understood that substrate material 20 may be other materials, such as paper, plastic, metal, and wood, as appropriate to the article of manufacture.

As shown in Figures 2 and 3, substrate material 20 of article of manufacture 10 has a surface 22. A pattern 30 is disposed on substrate material 20 and is formed by a plurality of similar images 32 having a selected geometric shape 46 organized in a matrix 24. It can be seen that each image 32 includes printed portions 42 and unprinted portions 44. The ratio of printed portions 42 to unprinted portions 44 within each image 32 decreases in a primary direction "P", such that image 32 is gradually shaded in primary direction "P" so as to provide the illusion of a shadow gradient 54 in the primary direction "P" across each of said images 32.

As shown in Figure 3, matrix 24 has a plurality of rows, shown here as R_1, R_2 and R_3, wherein said rows extend in a first direction "F". Here, first direction "F" and primary direction "P" are perpendicular. The images 32 in each row have centers 34 that are aligned with one another. The centers 34 of each image 32 in a selected row is equidistantly spaced from the center of an adjacent image in a selected row by a distance "S". The distance "S" is greater than a dimension "D" of one of the images in the first direction "F". Here, "D" is the diameter of image 32 having a selected geometric shape 46 of a circle.

It may further be seen from Figure 3, that the centers 34 of images 32 in adjacent rows, for example R_1 and R_2, are

offset. Here, a first axis 38 which is perpendicular to the first direction "F" and which passes through center 34 of a selected image in row R_1 is offset by a distance S/2 from a second axis 40 which is also perpendicular to first direction "F" and Which passes through the center 34 of an image 32 in adjacent row R_2. Images 32 may be arranged on surface 22 of substrate material 20 such that a line drawn between centers 34 of any adjacent images 32 has a distance "S". It may be seen from Figure 3 that in this configuration, lines connecting the centers 34 of three adjacent images 32 form an equilateral triangle 36 having sides of length "S".

It should be appreciated that other patterns are contemplated wherein images 32 may be distributed, uniformly or irregularly, on substrate material 20. It should be further appreciated that images 32 may be distributed in a pattern on substrate material 34 which simulates the dimple pattern of a selected golf ball. It should be further understood that images 32 may be formed on substrate material 20 by any of a variety of techniques, including wet-printing, silk-screening, and fabric-weaving. Further, substrate material 20 and printed portions 42 may be colored a variety of colors. It is preferred that printed portions 42 are colored a color darker than the color of substrate material 20, so as to give the illusion of a shadow gradient across image 32. Printed portions 42 may, however, be colored a color lighter than the color of substrate material 20. Preferably, printed portions 42 are black and substrate material 20 is white.

With reference to Figures 4-8, five exemplary embodiments of the images 32 of the present invention are provided. It should be understood that any one of these exemplary embodiments is preferably disposed on substrate material 20 in the manner described in reference to Figures 2 and 3 above. It should be understood from Figures 4-8 that

geometric shape 46 may be a circle or a polygon having N sides wherein N is at least 3. It should be appreciated that other geometric shapes, such as ellipses and ovals, may be used.

Figure 4 shows a first exemplary image 32 of the present invention, wherein a graduated dot pattern 50 is utilized to gradually shade image 32 in primary direction "P". Here, printed portions 42 are equidistantly spaced within image 32. Unprinted portions 44 are also included in image 32. The size of printed portions 42 decreases in the primary direction "P" such that the ratio of printed portions 42 to unprinted portions 44 gradually decreases. It may be seen from Figure 4 that printed portions 42 are circular dots having sizes which gradually decrease in the primary direction "P". It should be understood, however, that printed portions 42 of shapes other than circular may be used. It may also be seen that image 32 has a boundary 48 which is discontinous.

With reference to Figure 5, it may be seen that in a second exemplary image 232, a thick-to-thin linear pattern 252 may be used to gradually shade image 232. Here, printed portions 242 are bands 256 which are equidistantly spaced apart in image 232 and which run parallel to primary direction "P". It can be seen that each of bands 256 tapers in the primary direction "P" so as to gradually shade image 232. Further, boundary 248 has portions which are discontinuous.

With reference to Figure 6, a third exemplary image 332 utilizes a different type of thick-to-thin linear pattern 358 to give the illusion of a shadow gradient across image 332. Here, printed portions 342 are bands 356 which are equidistantly spaced apart in image 332 and which run perpendicular to primary direction "P". Each band 356 has a band height "h" measured in the primary direction. Band

height "h" of bands 356 progressively diminishes in the primary direction, such that band height "h" of bands in the primary direction "P" is smaller relative to bands 356 opposite the primary direction "P". Boundary 348 is discontinuous around image 332.

As shown in Figures 7 and 8, fourth exemplary image 432 and fifth exemplary image 532 have geometric shapes 446 and 546 that are a hexagon and octagon, respectively. Here, thick-to-thin linear patterns 452 and 558, respectively, are used to gradually shade images 432 and 532. It should be noted that dimension "D" shown in Figures 7 and 8 is a dimension of image 432 and 532. Here, dimension "D" is measured in a direction perpendicular to primary direction "P". However, dimension "D" may be measured in other directions, such as in first direction "F" as shown in Figures 2 and 3. It should also be noted that here, boundaries 448 and 548 are continuous around images 432 and 532.

It should be appreciated from Figures 4-8, that a variety of combinations of geometric shapes 46 and printed portions 42 are contemplated in the formation of images 32. It should further be appreciated that additional varieties of printed portions 44 are contemplated for the gradual shading of images 32. It should also be understood that, with respect to Figures 2 and 4-8, combinations of images having different geometric shapes 46, different printed portions 42 and different dimensions "D" may all be disposed on substrate 20 of article of manufacture 10.

Figure 9 shows a substrate material 620 having a pattern 630 according to a second exemplary embodiment of the present invention. Here, pattern 630 includes an array 626 of images 632 distributed on substrate material 620. In this embodiment, however, it can be seen that the primary

direction "P" is oriented at an angle "a" with respect to the first direction. With respect to Figure 10, showing a substrate material 720 having a pattern 730 including an array 726 of images 732 according to a third exemplary embodiment of the present invention, it can be seen that primary direction "P" is oriented parallel to first direction "F". Here, primary direction "P" is oriented oppositely to first direction "F", but it should be understood that primary direction "P" may be in the same direction as first direction "F". It should further be understood from Figures 9 and 10 that primary direction "P" may be oriented at any angle with respect to first direction "F".

Accordingly, the present invention has been described with some degree of particularity directed to the exemplary embodiments of the present invention. It should be appreciated, though, that the present invention is defined by the following claims construed in light of the prior art so that modifications or changes may be made to the exemplary embodiment of the present invention without departing from the inventive concepts contained herein.

I claim:

1. An article of manufacture, comprising

(a) a substrate material; and

(b) a pattern disposed on said substrate material, said pattern formed by a plurality of similar images organized in a matrix, each of said images having a selected geometric shape with a center, said matrix having a plurality of rows of said images extending in a first direction wherein the images in each said row have centers that are aligned with one another, the center of each image in a selected row

equidistantly spaced from the center of an adjacent image in the selected row by a distance S which is greater than a dimension of one of said images in the first direction, and wherein each image includes printed and unprinted portions such that the ratio of printed to unprinted portions decreases in a primary direction.

2. An article of manufacture according to claim 1 wherein a first axis perpendicular to the first direction which passes through the center of a selected image in a row is offset by a distance S/2 from a second axis perpendicular to the first direction which passes through the center of an image in an adjacent row.

3. An article of manufacture according to claim 1 wherein said geometric shape is selected from a group consisting of a circle, an oval, an ellipse, and polygons having N sides, wherein N is greater than or equal to 3.

4. An article of manufacture according to claim 3 wherein said geometric shape is a circle, and the dimension is a diameter of the circle.

5. An article of manufacture according to claim 1 wherein said printed portions are equidistantly spaced within said image, and wherein the size of the printed portions decreases in the primary direction.

6. An article of manufacture according to claim 5 wherein the printed portions are circular.

7. An article of manufacture according to claim 1 wherein said printed portions are bands equidistantly spaced apart within said image and have a band height measured in the primary direction, progressively in the primary direction,

said bands diminishing in height progressively in the primary direction.

8. An article of manufacture according to claim 7 wherein said bands are oriented perpendicular to said primary direction.

9. An article of manufacture according to claim 1 wherein said printed portions are bands equidistantly spaced apart within said image, each of said bands tapering in the primary direction.

10. An article of manufacture according to claim 9 wherein said bands are oriented parallel to said primary direction.

11. An article of manufacture according to claim 1 wherein the primary direction is oriented at an angle with respect to the first direction.

12. An article of manufacture according to claim 11 wherein the primary direction is perpendicular to the first direction.

13. An article of manufacture according to claim 1 wherein each of said images has a discontinuous boundary therearound.

14. An article of manufacture according to claim 1 wherein said printed portions provide the illusion of a shadow gradient in the primary direction across each of said images.

15. An article of manufacture according to claim 1 wherein said substrate material is colored a first color and

said printed portions are colored a second color darker than said first color.

16. An article of manufacture according to claim 1 wherein said substrate material is selected from a group consisting of fabric, paper, plastic, metal, and wood.

17. An article of manufacture according to claim 1 wherein said substrate is formed of a flexible material.

18. An article of manufacture according to claim 1 wherein said printed portions are formed by a technique selected from a group consisting of wet-printing, silk-screening and fabric-weaving.

19. A method of creating an illusion of the dimpled exterior of a golf ball on a surface, comprising the steps of:

(a) providing an article of manufacture having a surface; and

(b) disposing a plurality of similar images on said surface, each said image having a selected geometric shape, and wherein each of said images is gradually shaded in a primary direction, said step of disposing including arranging the images into a pattern on the surface, wherein the center of a selected image is equidistantly spaced apart from the centers of adjacent images by a distance S which is greater than a dimension of one of said images in a selected direction.

20. A method according to claim 19 wherein the geometric shape is a circle.

21. A method according to claim 19 wherein each image includes a plurality of printed and unprinted portions

whereby the ratio of printed to unprinted portions progressively decreases in the primary direction, thereby to gradually shade each image in the primary direction.

22. A method according to claim 19 wherein each image is shaded by a graduated dot pattern.

23. A method according to claim 19 wherein each image is shaded by a thick-to-thin linear pattern.

24. An article of manufacture, comprising:

(a) a substrate material; and

(b) an array of similar images distributed on the substrate material, each image having a selected geometric shape, wherein each image includes printed and unprinted portions whereby the ratio of printed to unprinted portions in each image decreases in a primary direction.

25. An article of manufacture according to claim 24 wherein said images are uniformly distributed on the substrate material.

26. An article of manufacture according to claim 24 wherein said array includes a row of images.

27. An article of manufacture according to claim 24 wherein lines connecting the centers of three adjacent images form an equilateral triangle.

28. An article of manufacture according to claim 24 wherein a selected image has a size different from the size of an adjacent image.

29. An article of manufacture according to claim 24 wherein a selected image has a geometric shape different from the geometric shape of an adjacent image.

30. An article of manufacture according to claim 24 wherein said images are distributed on the substrate material thereby to simulate a dimple pattern of a selected golf ball.

SEE FOLDOUT EXHIBITS
FIGURES 1-10

Fig. 1

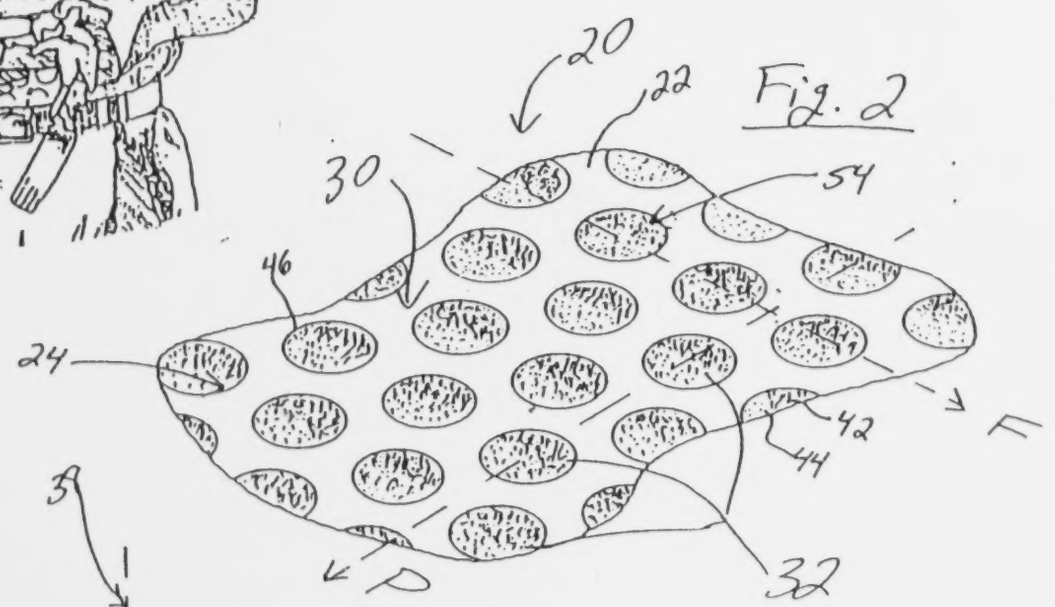


Fig. 2

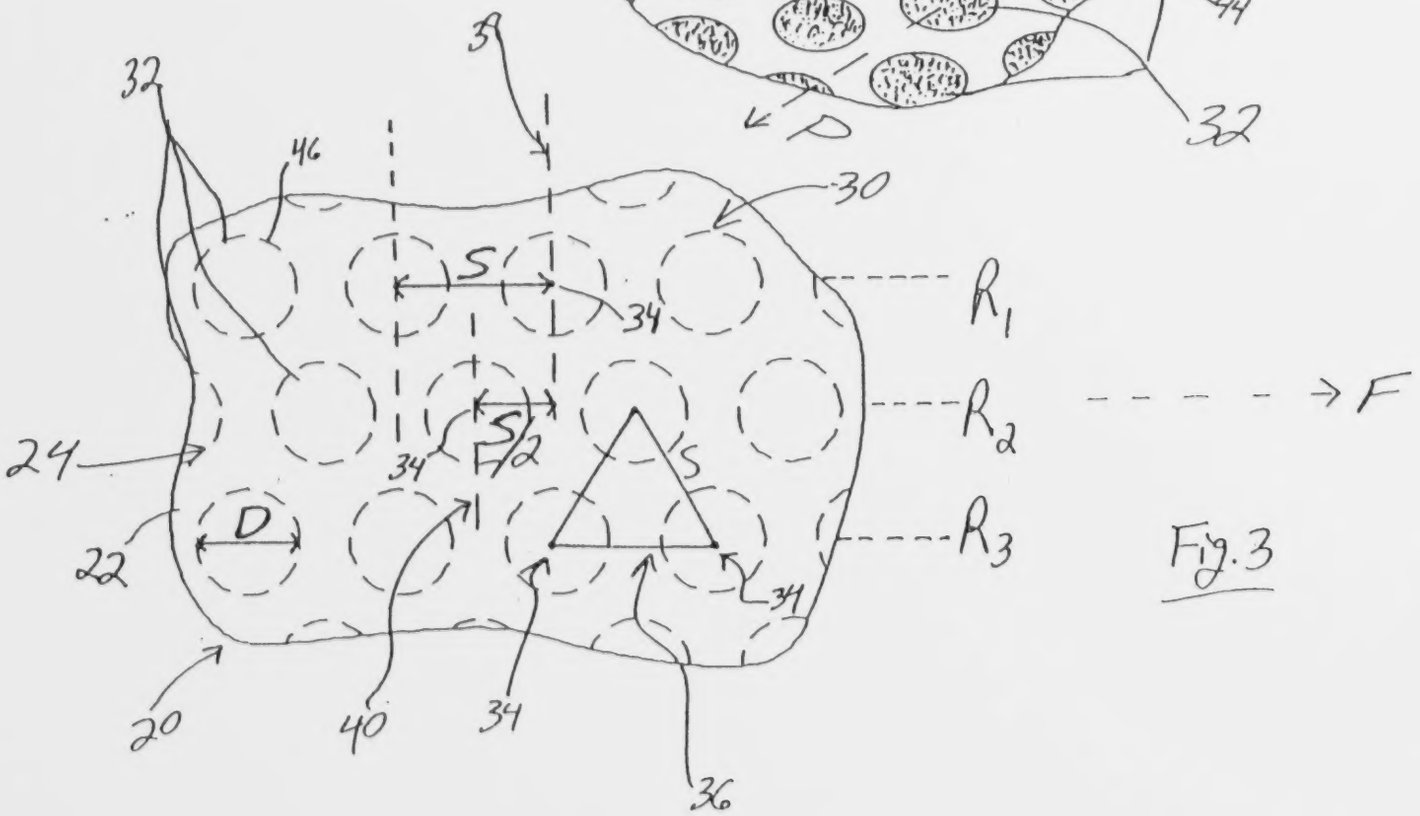


Fig. 3

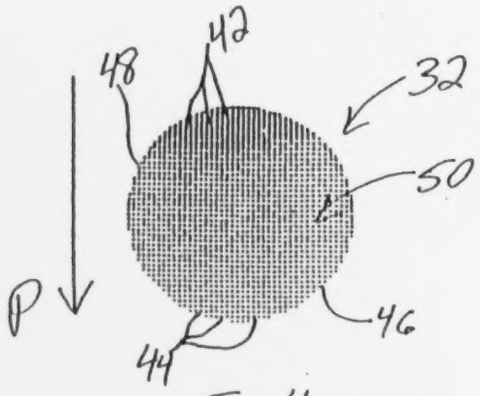


Fig. 4

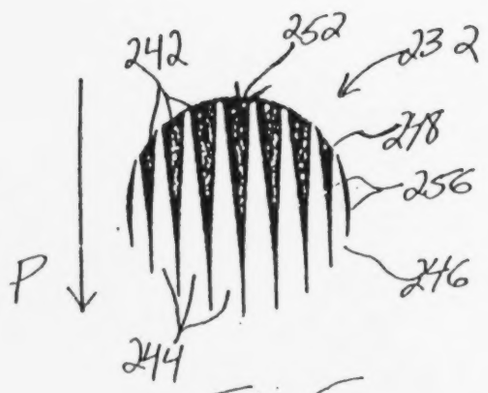


Fig. 5

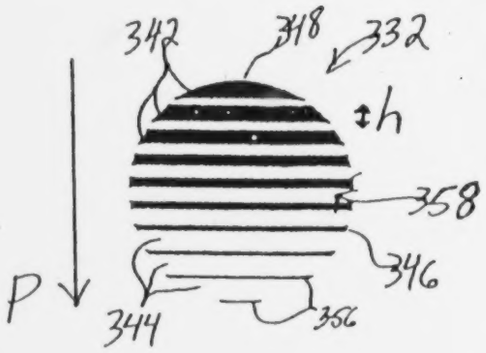


Fig. 6

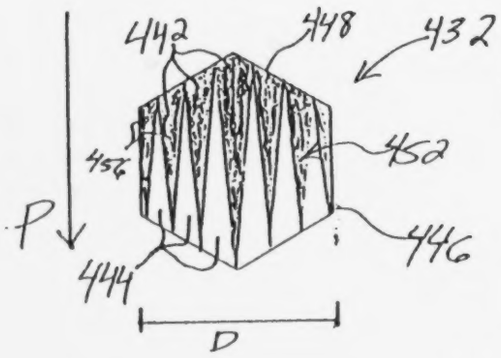


Fig. 7

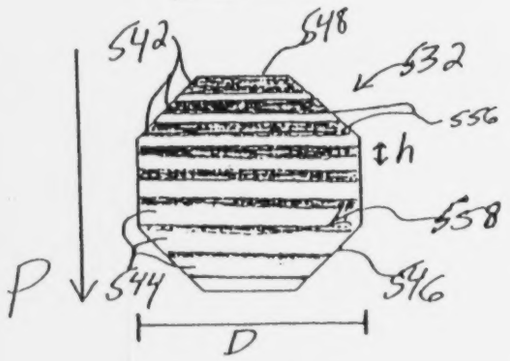


Fig. 8

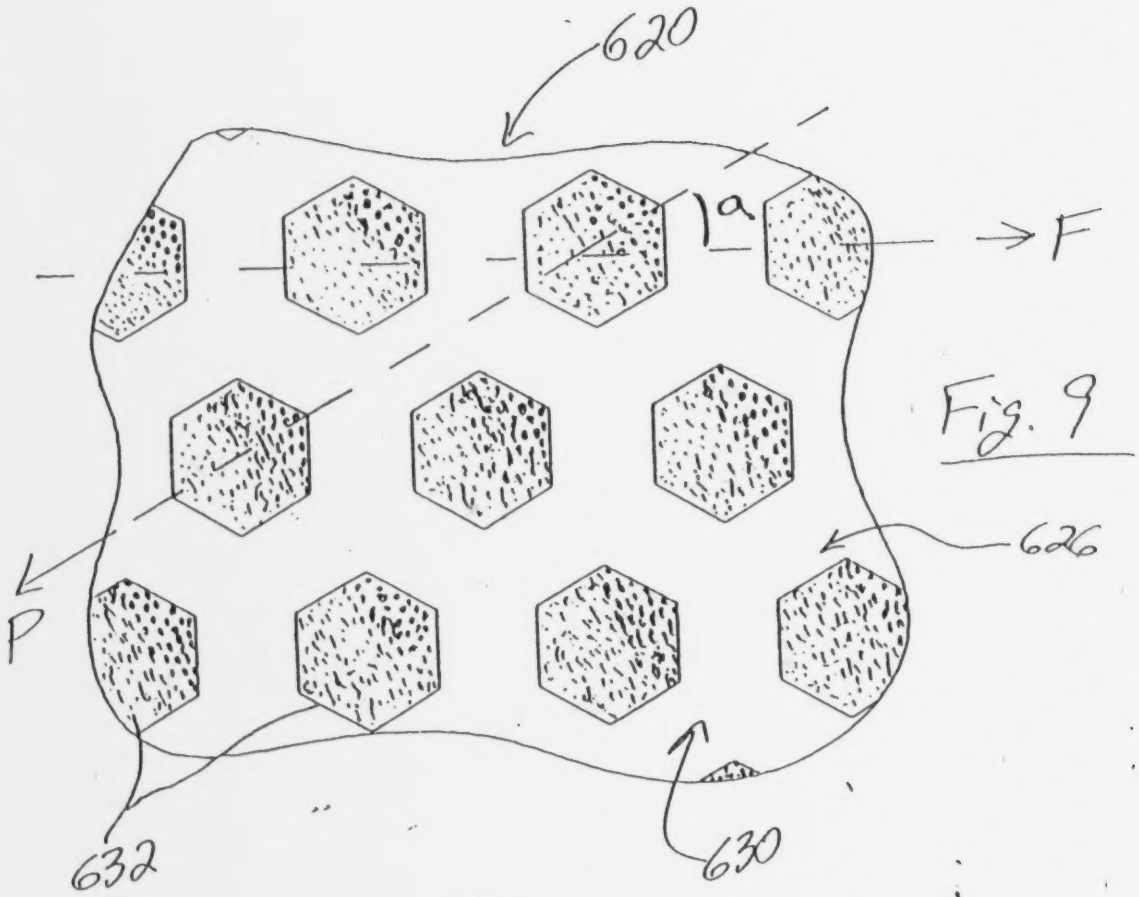


Fig. 9

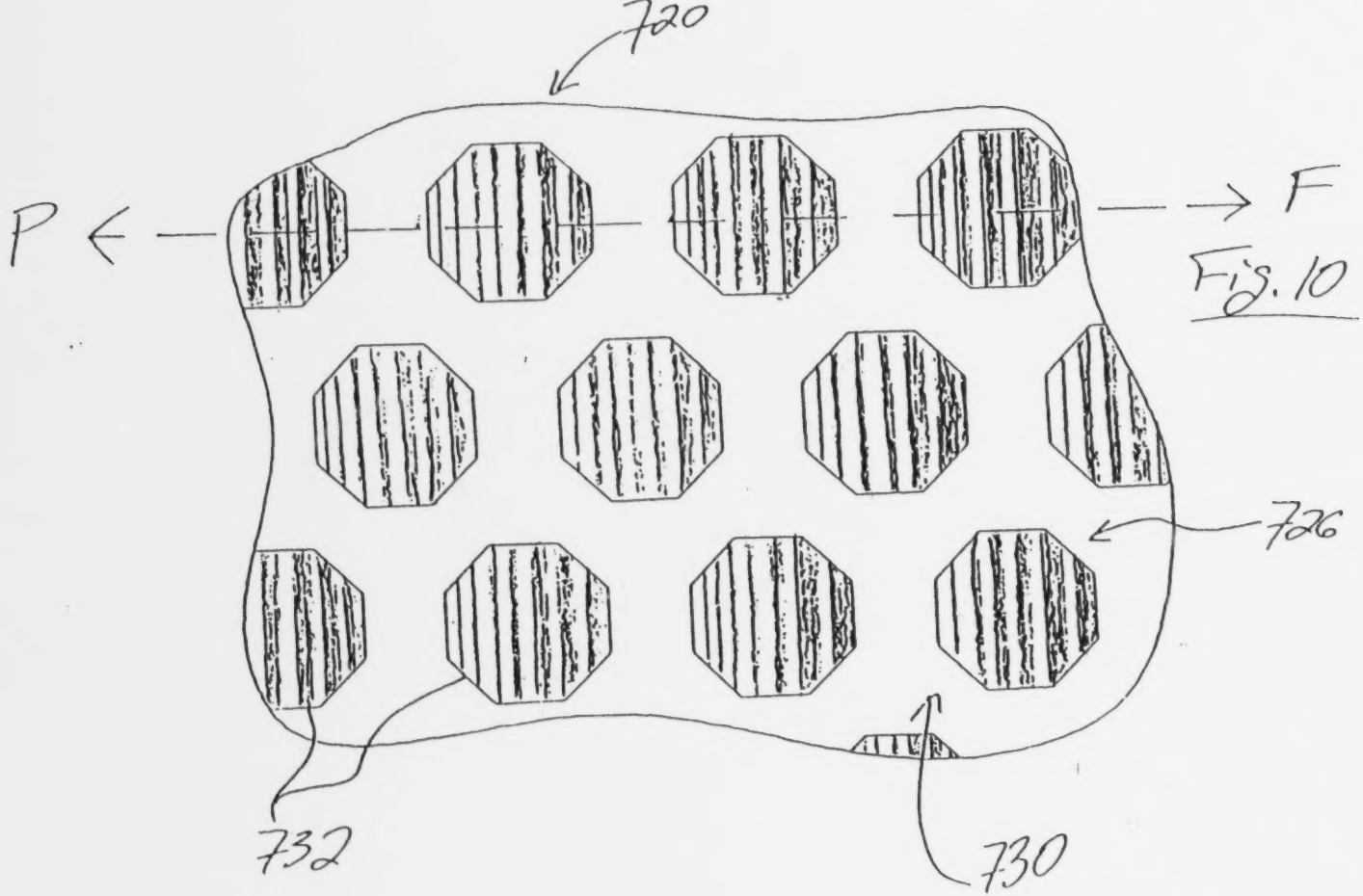


Fig. 10

APPENDIX D

PRIOR ART DESIGN PATENTS

SEE FOLDOUT EXHIBIT

H.R. Towne
Pattern for Wrapping Paper
No. 23,408
Patented July 3, 1894

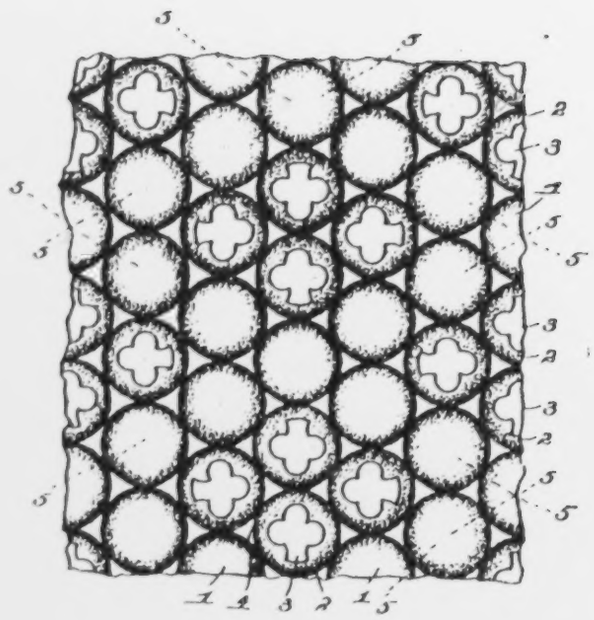
D5-20
D5379 OR D 23,408 EX

DESIGN.

H. R. TOWNE.

PATTERN FOR WRAPPING PAPER.

No. 23,408. Patented July 3, 1894.



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Witnesses:
Harry S. Adams
Walter E. Allen

Inventor:
Henry R. Towne
By Knight Bros
Attys.

UNITED STATES PATENT OFFICE

HENRY R. TOWNE, OF STAMFORD, CONNECTICUT,
ASSIGNOR TO THE YALE & TOWNE
MANUFACTURING COMPANY, OF SAME PLACE.

DESIGN FOR A PATTERN FOR WRAPPING-PAPER.

SPECIFICATION forming part of Design No. 23,408,
dated July 3, 1894.

Application filed September 7, 1893, Serial No. 485,021,
Term of patent 14 years.

To all whom it may concern:

Be It known that I, HENRY R. TOWNE, a citizen of the United States, residing at Stamford, in the county of Fairfield and State of Connecticut, have invented and produced a new and original Design for a Pattern for Wrapping-Paper, of which the following is a specification.

My invention is a pattern for wrapping paper, which is more particularly intended to be used for wrapping or covering boxes or other receptacles, but is likewise useful in other connections where an ornamental or attractive effect is desired.

My design is made up of a number of tangentially arranged circles 1, 2, shaded within their peripheries to represent spherical surfaces, of which circles those marked 1 have plain central fields while those marked 2 are further ornamented by a trefoil figure 3, and the circles thus ornamented are assembled in diamond shaped groups 4, which are so disposed over the surface as to leave between them

lines 5 of plain circles 1. These trefoil figures provide panels for suitable lettering or words.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

The design for a pattern for wrapping paper; substantially as herein shown and described.

HENRY R. TOWNE

Witnesses:
SCHUYLER MERRITT,
GEO. E. WHITE.

SEE FOLDOUT EXHIBIT

S.M. Block
Netting
No. 32,265
Patented Feb. 20, 1900

05-20 EX

05379 OP D 32,265

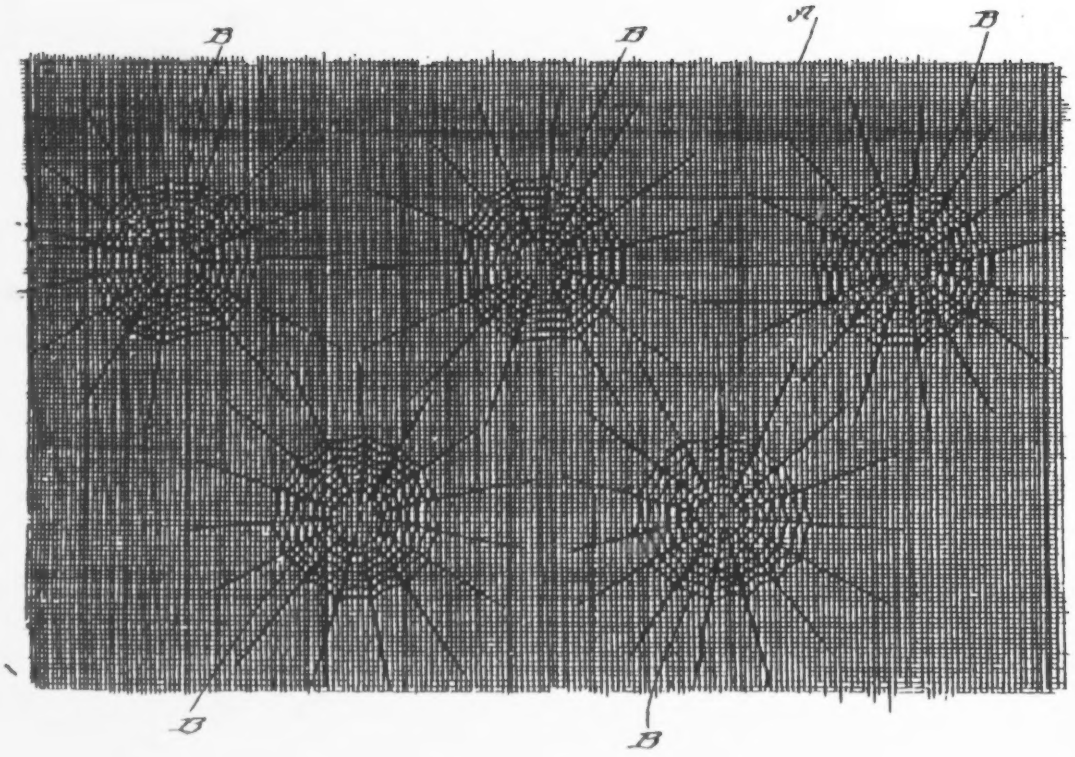
DESIGN.

No. 32,265. Patented Feb. 20, 1900.

S. M. BLOCK.

NETTING.

(Application filed Jan. 28, 1900.)



WITNESSES:

William P. Goebel.

Geo. G. Hosford.

INVENTOR

Solomon M. Block

BY

ATTORNEYS

THE HENRY PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE

SOLOMON M. BLOCH, OF NEW YORK, N. Y.

DESIGN FOR NETTING

SPECIFICATION forming part of Design No. 32,265, dated February 20, 1900.

Application filed January 25, 1900. Serial No. 2,804, Term of patent 3½ years.

To all whom it may concern:

Be it known that I, SOLOMON M. BLOCH, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented and produced a new and original Design for Netting, of which the following is a full, clear, and exact description.

Reference is to be had to the accompanying drawing, forming a part of this specification, in which the figure is a face view of the netting, showing my design.

The invention relates to open-mesh fabrics, such as are used for veils, hat-trimmings, and the like.

The design in its entirety consists of an open-mesh fabric-body A, having imitation-cobweb ornaments B appearing spaced on the meshes of said body, the circular and radial lines of the ornaments appearing as heavy broken lines in contrast to the fine regular lines of the mesh of the fabric-body.

The leading feature of the design consists of the cobweb-ornamented open-mesh fabric-body.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

The design for a netting, as herein shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SOLOMON M. BLOCH

Witnesses:
LOUIS O. LEVY,
ROBERT L. DEMAREST

SEE FOLDOUT EXHIBIT

G. Becker
Wall Paper
No. 41,502
Patented June 20, 1911

DESIGN.

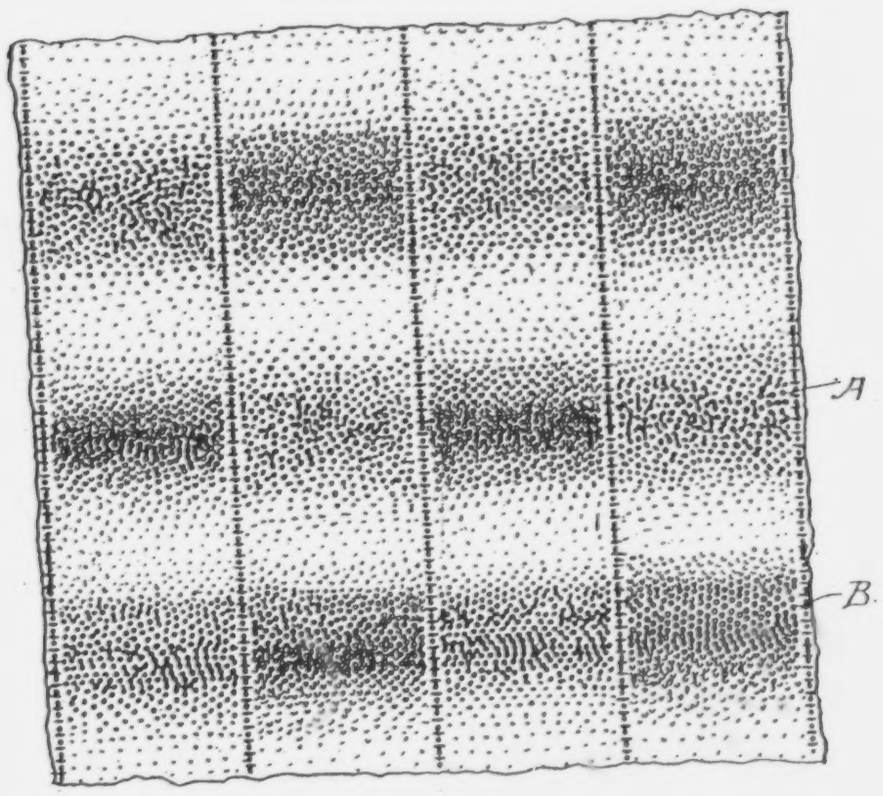
C. BECKER.

WALL PAPER.

APPLICATION FILED JUNE 20, 1910.

Patented June 20, 1911.

41,502.



WITNESSES:

Robt. P. Kitchel.

Jos. B. Kennedy Jr.

INVENTOR

Caspar Becker

BY Charles N. Butler

ATTORNEY.

UNITED STATES PATENT OFFICE

CASPAR BECKER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO BECKER, SMITH & PAGE, INC., OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA

DESIGN FOR WALL-PAPER

41,502. Specification for Design. Patented June 20, 1911.

Application filed June 20, 1910. Serial No. 568,056.
Term of patent 7 years.

To all whom it may concern:

Be it known that I, CASPAR BECKER, a citizen of the United States, residing in the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented a new, original, and ornamental Design for Wall-Paper, of which the following is a specification, reference being had to the accompanying drawing, forming part thereof.

The drawing illustrates a section of wall paper embodying my new design, which comprises a series of parallel stripes, each stripe being composed of alternate sections of irregularly disposed dark dots A and irregularly disposed light dots B so arranged that the sections of irregularly disposed light dots in one stripe shall be adjacent to sections of irregularly disposed dark dots in the adjacent stripes and vice versa, the stripes being separated by gilt lines composed of dots and dashes.

I claim:

The ornamental design for wall paper as shown and described.

CASPAR BECKER

Witnesses:
ROBERT JAMES EARLEY,
JOS. G. DENNY, Jr.

SEE FOLDOUT EXHIBIT

W.S. Friedlander
Cotton Fabric for Tents and the Like
No. 58,743
Patented Aug. 30, 1921

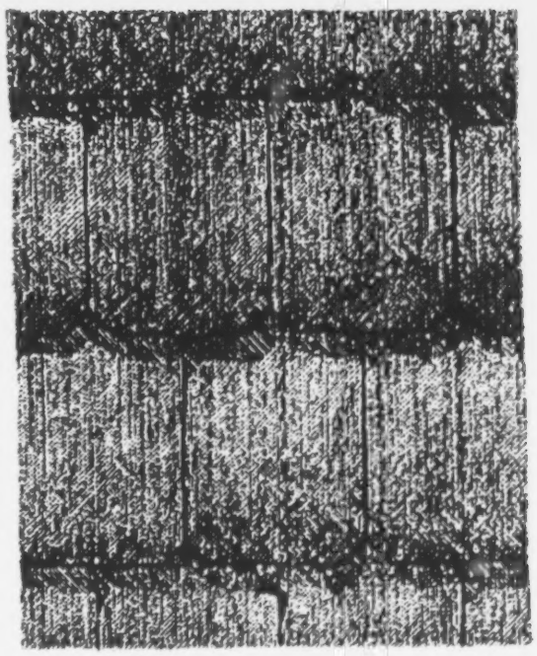
DESIGN.

W. S. FRIEDLANDER.

COTTON FABRIC FOR TENTS AND THE LIKE.

APPLICATION FILED MAR. 26, 1921.

58,743. Patented Aug. 30, 1921.



Inventor
William S. Friedlander
By his Attorneys
Sheffield & Betts -

UNITED STATES PATENT OFFICE

WILLIAM S. FRIEDLANDER, OF PASSAIC, NEW JERSEY, ASSIGNOR TO TATE ELECTROLYTIC TEXTILE PROCESSES, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

DESIGN FOR COTTON FABRIC FOR TENTS AND THE LIKE

58,743. Specification for Design. Patented Aug. 30, 1921.

Application filed March 26, 1921. Serial No. 455,996.
Term of patent 14 years

To all whom it may concern:

Be it known that I, William S. Friedlander, a citizen of the United States, residing in Passaic, county of Passaic, and State of New Jersey, have invented a new, original, and ornamental Design for Cotton Fabric for Tents and the like, of which the following is a specification, reference to be had of the accompanying drawing, forming part thereof.

The figure is a plain view of a length of fabric showing my new design.

I claim:

The ornamental design for cotton fabric for tents and the like substantially as shown.

WILLIAM S. FRIEDLANDER

SEE FOLDOUT EXHIBIT

E.B. Vandergaw et al
Flocked Voile Fabric
No. 65,880
Patented Oct. 28, 1924

D5-57 EX

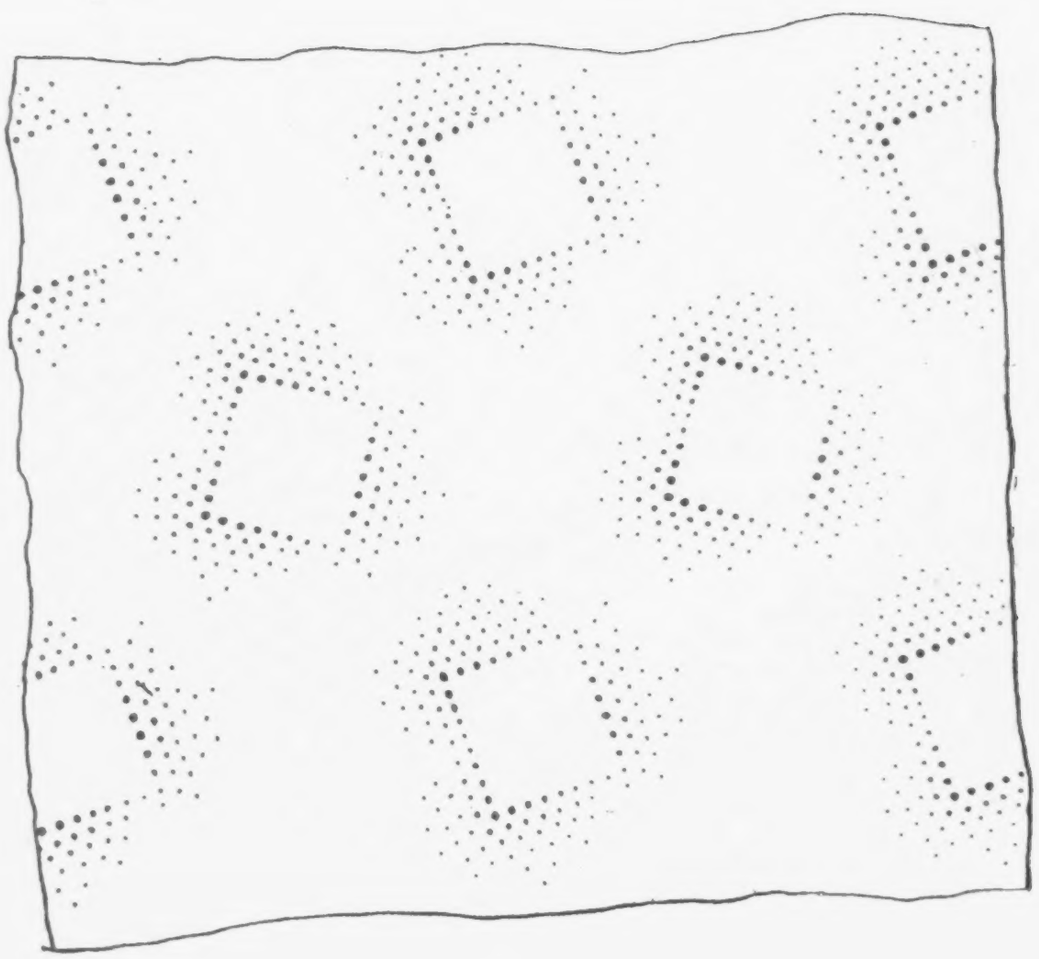
D5379 OR D 65,880

Oct. 28, 1924. Des. 65,880

E. B. VANDERGAW ET AL

FLOCKED VOILE FABRIC

Filed Aug. 30, 1924



INVENTORS
Edward B. Vandergaw
and Jules Heintich
BY their ATTORNEY
Charles G. Hensley

UNITED STATES PATENT OFFICE

EDWARD B. VANDERGAW, OF BROOKLYN, AND
JULES HEINRICH, OF NEW YORK, N. Y.,
ASSIGNORS TO FRED BUTTERFIELD & CO. INC.,
OF NEW YORK, N. Y.,
A CORPORATION OF NEW YORK.

DESIGN FOR FLOCKED VOILE FABRIC

Application filed August 30, 1924. Serial No. 10,617.
Term of patent 3½ years.

To all whom it may concern:

Be it known that we, Edward B. Vandergaw and Jules Heinrich, citizens of the United States, residing, respectively, in the boroughs of Brooklyn and Manhattan, in the city and State of New York, have jointly invented a new, original, and ornamental Design for Flocked Voile Fabric, of which the following is a specification, reference being had to the accompanying drawing forming part hereof.

The figure is a plan view of a piece of flocked voile fabric showing our new design.

We claim:

The ornamental design for flocked voile fabric, as shown.

EDWARD B. VANDERGAW
JULES HEINRICH

SEE FOLDOUT EXHIBIT

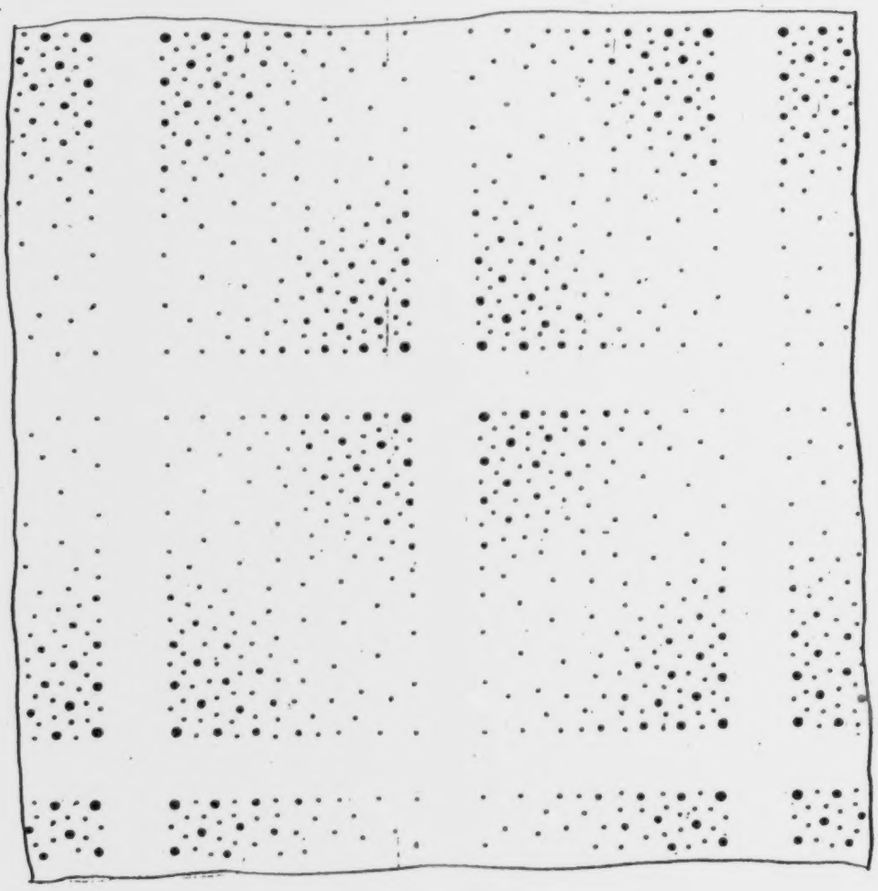
E. B. Vandergaw et al
Flocked Voile Fabric
No. 66,156
Patented Dec. 2, 1924

Dec. 2, 1924. Des. 66,156

E. B. VANDERGAW ET AL

FLOCKED VOILE FABRIC

Filed Aug. 30. 1924



INVENTORS

Edward B. Vandergaw
and Jules Heumlich

BY their ATTORNEY

Charles G. Hensley

UNITED STATES PATENT OFFICE

EDWARD B. VANDERGAW, OF BROOKLYN, AND
JULES HEINRICH, OF NEW YORK, N. Y.,
ASSIGNORS TO FRED BUTTERFIELD & CO., INC.,
OF NEW YORK, N. Y.,
A CORPORATION OF NEW YORK

DESIGN FOR FLOCKED VOILE FABRIC

Application filed August 30, 1924. Serial No. 10,600.
Term of patent 3½ years.

To all whom it may concern:

Be it known that we, EDWARD B. VANDERGAW and JULES HEINRICH, citizens of the United States, residing, respectively, in the borough of Brooklyn, and the borough of Manhattan, in the city and State of New York, have jointly invented a new, original, and ornamental Design for Flocked Voile Fabric, of which the following is a specification, reference being had to the accompanying drawing, forming part hereof.

The figure is a plan view of a piece of flocked voile fabric showing our new design.

We claim:

The ornamental design for flocked voile fabric, as shown.

EDWARD B. VANDERGAW
JULES HEINRICH

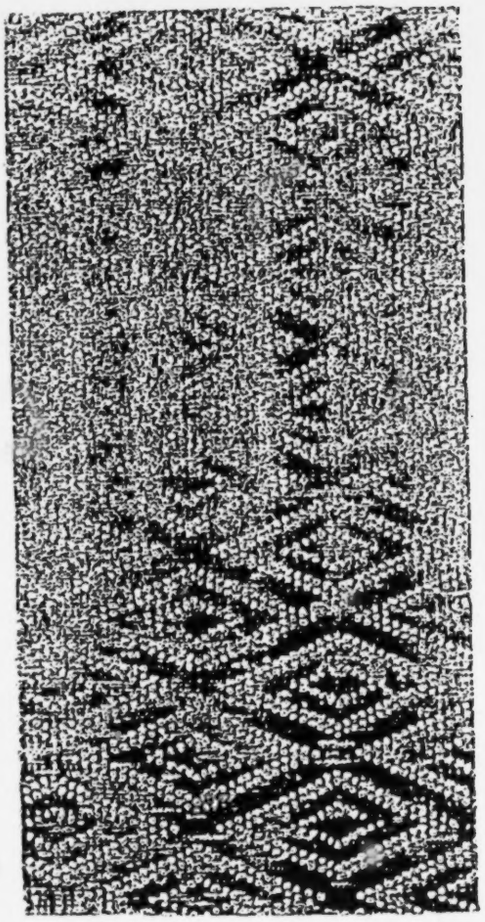
SEE FOLDOUT EXHIBIT

F.C. Green
Woven Cellophane and Cotton Fabric or Similar Article
No. 126,473
Patented April 8, 1941

April 8, 1941. F. C. GREEN Des. 126,473

WOVEN CELLOPHANE AND COTTON FABRIC OR SIMILAR ARTICLE

Filed Dec. 26, 1940



Frank C. Green
INVENTOR.

BY Alexander Chessin
ATTORNEY.

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UNITED STATES PATENT OFFICE

126,473

DESIGN FOR A WOVEN CELLOPHANE AND COTTON FABRIC OR SIMILAR ARTICLE

Frank C. Green, Great Neck, N. Y., assignor to Dazian's Incorporated, New York, N. Y.

Application December 26, 1940. Serial No. 97,608

Term of patent 3½ years

To whom it may concern:

Be it known that I, Frank C. Green, a citizen of the United States, residing at Great Neck, in the county of Nassau and State of New York, have invented a new, original, and ornamental Design for a Woven Cellophane and Cotton Fabric or Similar Article, of which the following is a specification, reference being had to the accompanying drawing, forming part thereof, wherein—

The figure is a plan view of a woven Cellophane and cotton fabric or similar article, showing my new design.

My design comprises woven strips of Cellophane arranged on a contrasting background of cotton threads forming a diamond pattern, as shown.

I claim:

The ornamental design for a woven Cellophane and cotton fabric or similar article, substantially as shown and described.

FRANK C. GREEN

SEE FOLDOUT EXHIBIT

US Patent
Des. 429,894
Aug. 29, 2000

US00D429894S

United States Patent [19]

Bergin

[11] Patent Number: Des. 429,894

[45] Date of Patent: ** Aug. 29, 2000

[54] AWNING FABRIC

[75] Inventor: Bryan B. Bergin, Granger, Ind.

[73] Assignee: White Consolidated Industries, Inc., Cleveland, Ohio

[**] Term: 14 Years

[21] Appl. No.: 29/100,894

[22] Filed: Feb. 19, 1999

[51] LOC (7) Cl. 05-06

[52] U.S. Cl. D5/57

[58] Field of Search D5/8, 15, 45, 46, D5/47, 53, 56, 60, 62, 99; D12/106, 401, 403; D25/56, 57; 428/187, 195, 904.4

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D. 111,067	8/1938	Cohen .	
D. 121,090	6/1940	Cummings .	
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D. 130,864	12/1941	Abt .	
D. 164,922	10/1951	Gould	D5/7
D. 178,152	5/1956	Schwartz	D5/7
D. 366,763	2/1996	Sargent et al. .	
D. 395,170	6/1998	Bergin .	
1,055,051	3/1913	Knowles .	

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Graduated Dot Tints LT930, Letraset Product Update 1983 Catalog, p. 5, Jan. 1983.

Graduated Dot Background Pattern, Horning: Background patterns, Textures and tints, No page number, Dec. 1976.

Primary Examiner—Robert M Spear

Attorney, Agent, or Firm—Pearne & Gordon LLP

[57] CLAIM

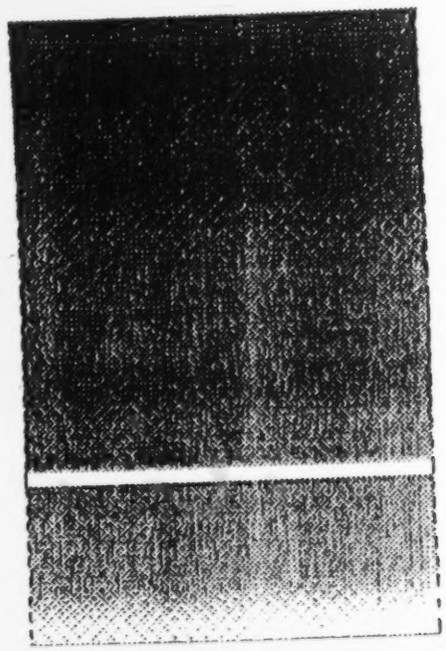
The ornamental design for an awning fabric as shown and described.

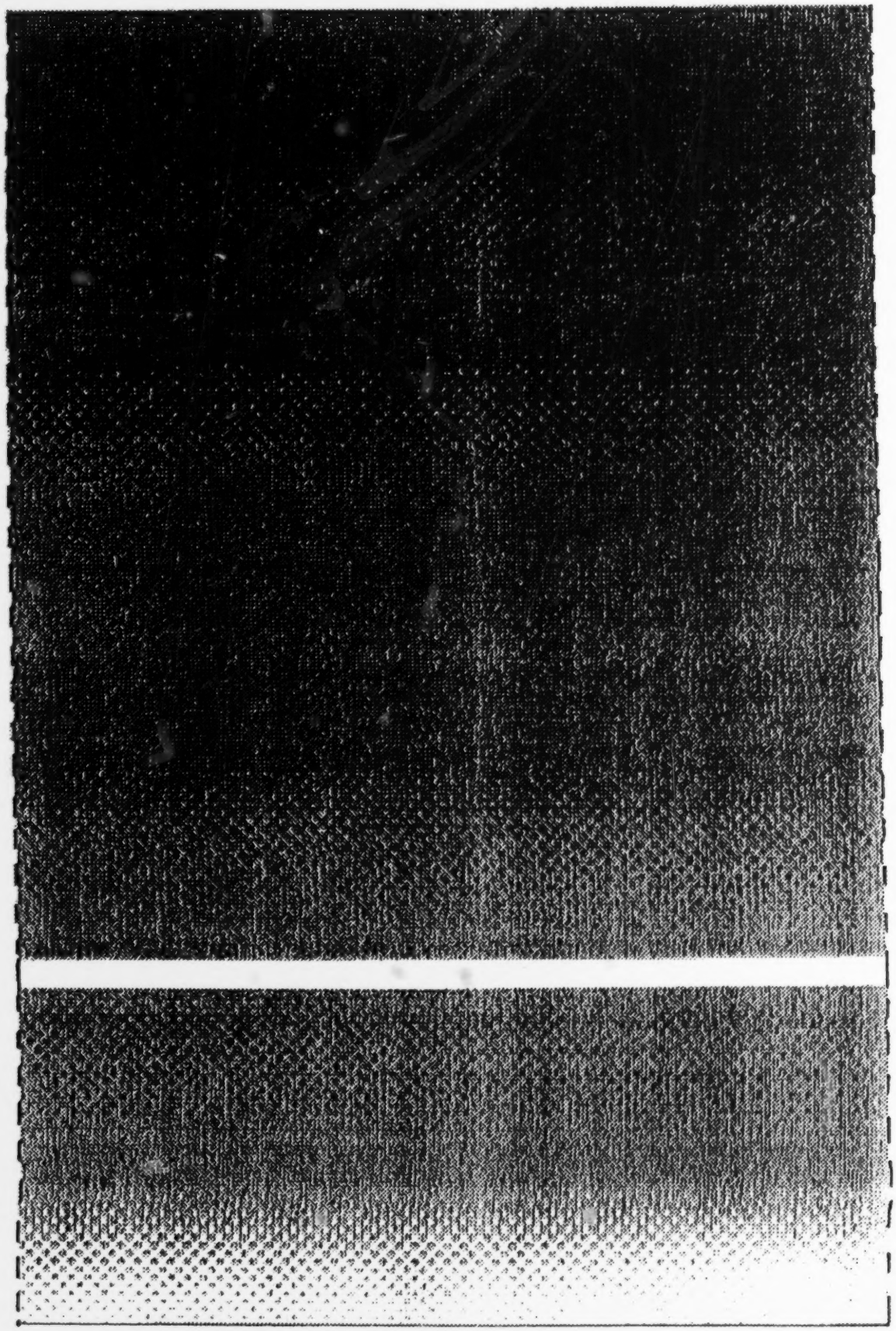
DESCRIPTION

The FIGURE shows a top view of an awning fabric according to the invention. The pattern continues uniformly for an indeterminate width in the right and/or left direction. The bottom view of the awning fabric is a mirror image of the view shown in the drawing. The fabric has no substantial thickness.

The broken line boundaries in the drawing are for illustrative purposes only and form no part of the claimed design.

1 Claim, 1 Drawing Sheet





APPENDIX E

CLAIMS 1-34, 36, and 39-46 ON APPEAL

1. An article of manufacture that provides an illusion of the dimpled exterior of a golf ball on a surface thereof, comprising:

(a) a substrate material; and

(b) a pattern disposed on said substrate material, said pattern formed by a plurality of similar images organized in a matrix, each of said images having a selected geometric shape with a center, said matrix having a plurality of rows of said images extending in a first direction wherein the images in each said row have centers that are aligned with one another, the center of each image in a selected row equidistantly spaced from the center of adjacent images in the selected row by a distance S which is greater than a longest dimension in the first direction of a longer one of said adjacent images in the first direction, and wherein each image includes printed and unprinted portions such that the ratio of printed to unprinted portions decreases in a primary direction.

2. An article of manufacture according to claim 1 wherein a first axis perpendicular to the first direction which passes through the center of a selected image in a row is offset by a distance S/2 from a second axis perpendicular to the first direction which passes through the center of an image in an adjacent row.

3. An article of manufacture according to claim 1 wherein said geometric shape is selected from a group consisting of a circle, an oval, an ellipse, and polygons having N sides, wherein N is greater than or equal to 3.

4. An article of manufacture according to claim 3 wherein said geometric shape is a circle, and the dimension is a diameter of the circle.

5. An article of manufacture according to claim 1 wherein said printed portions are equidistantly spaced within said image, and wherein the size of the printed portions decreases in the primary direction.

6. An article of manufacture according to claim 5 wherein the printed portions are circular.

7. An article of manufacture according to claim 1 wherein said printed portions are bands equidistantly spaced apart within said image and have a band height measured in the primary direction, said bands diminishing in height progressively in the primary direction.

8. An article of manufacture according to claim 7 wherein said bands are oriented perpendicular to said primary direction.

9. An article of manufacture according to claim 1 wherein said printed portions are bands equidistantly spaced apart within said image, each of said bands tapering in the primary direction.

10. An article of manufacture according to claim 9 wherein said bands are oriented parallel to said primary direction.

11. An article of manufacture according to claim 1 wherein the primary direction is oriented at an angle with respect to the first direction.

12. An article of manufacture according to claim 11 wherein the primary direction is perpendicular to the first direction.

13. An article of manufacture according to claim 1 wherein each of said images has a discontinuous boundary therearound.

14. An article of manufacture according to claim 1 wherein said printed portions provide the illusion of a shadow gradient in the primary direction across each of said images.

15. An article of manufacture according to claim 1 wherein said substrate material is colored a first color and said printed portions are colored a second color darker than said first color.

16. An article of manufacture according to claim 1 wherein said substrate material is selected from a group consisting of fabric, paper, plastic, metal, and wood.

17. An article of manufacture according to claim 1 wherein said substrate is formed of a flexible material.

18. An article of manufacture according to claim 1 wherein said printed portions are formed by a technique selected from a group consisting of wet-printing, silk-screening and fabric-weaving.

19. A method of creating an illusion of the dimpled exterior of a golf ball on a surface, comprising the steps of:

(a) providing an article of manufacture having a surface; and

(b) disposing a plurality of similar images on said surface in spaced apart relation to one another, each said image having a selected geometric shape, and wherein each of said images is gradually shaded in a primary direction, said step of disposing including arranging the images into a pattern on the surface, wherein the center of a selected image is equidistantly spaced apart from the centers of adjacent images by a distance S which is greater than a dimension of one of said images in a selected direction.

20. A method according to claim 19 wherein the geometric shape is a circle.

21. A method according to claim 19 wherein each image includes a plurality of printed and unprinted portions whereby the ratio of printed to unprinted portions progressively decreases in the primary direction, thereby to gradually shade each image in the primary direction.

22. A method according to claim 19 wherein each image is shaded by a graduated dot pattern.

23. A method according to claim 19 wherein each image is shaded by a thick-to-thin linear pattern.

24. An article of manufacture that provides an illusion of the dimpled exterior of a golf ball on a surface thereof, comprising:

(a) a substrate material; and

(b) an array of identical images distributed on the substrate material in spaced apart relation to one another, each image having a selected geometric shape, wherein each image includes printed and unprinted portions whereby the ratio of printed to unprinted portions in each image decreases in a primary direction.

25. An article of manufacture according to claim 24 wherein said images are uniformly distributed on the substrate material.

26. An article of manufacture according to claim 24 wherein said array includes a row of images.

27. An article of manufacture according to claim 24 wherein lines connecting the centers of three adjacent images form an equilateral triangle.

28. An article of manufacture according to claim 1 wherein a selected image has a size different from the size of an adjacent image.

29. An article of manufacture according to claim 1 wherein a selected image has a geometric shape different from the geometric shape of an adjacent image.

30. An article of manufacture according to claim 24 wherein said images are distributed on the substrate material thereby to simulate a dimple pattern of a selected golf ball.

31. An article of manufacture according to claim 1 wherein said substrate material is flexible.

32. An article of manufacture according to claim 31 wherein said substrate material is a flexible fabric.

33. An article of manufacture according to claim 1 wherein the surface is smooth.

34. A method according to claim 19 wherein the step of providing includes providing an article of manufacture having a smooth surface, and wherein the step of disposing includes disposing said images on said smooth surface.

35. (Canceled)

36. An article of manufacture according to claim 24 wherein the surface is smooth.

37. (Canceled)

38. (Canceled)

39. An article of manufacture according to claim 24 wherein each image provides an illusion of a shadow in a concavity of a dimpled portion of a golf ball.

40. An article of manufacture made according to the method of claim 19 wherein said surface is smooth.

41. An article of manufacture made according to the method of claim 19 wherein said images are formed on said surface by a technique selected from the group consisting of wet-printing, silk-screening, and fabric weaving.

42. An article of manufacture according to claim 1 wherein said pattern is formed on said substrate material by a technique selected from the group consisting of wet-printing, silk-screening, and fabric weaving.

43. An article of manufacture according to claim 24 wherein said ratio of printed to unprinted portions in each image gradually decreases along an entire length of each image in the primary direction.

44. An article of manufacture that provides an illusion of the dimpled exterior of a golf ball on a surface thereof, comprising:

(a) a substrate material; and

(b) an array of circular images distributed in spaced apart relation to one another on the substrate material, wherein the center of each said circular image is equidistantly spaced from the centers of adjacent circular images, and wherein each of said circular images is gradually shaded in a primary direction.

45. An article of manufacture that provides an illusion of the dimpled exterior of a golf ball on a surface thereof, comprising:

(a) a substrate material; and

(b) an array of identical circular images distributed in spaced apart relation to one another on the substrate material, each said circular image having a common diameter D, and wherein the center of each said circular image is equidistantly spaced from the centers of adjacent circular images thereto by a distance S that is greater than the common diameter D, and wherein each of said circular images is gradually shaded in a primary direction.

46. An article of manufacture that provides a three-dimensional illusion of the dimpled exterior of a golf ball on a surface thereof, comprising:

(a) a substrate material; and

(b) an array of identical circular images distributed in spaced apart relation to one another on a surface of said substrate material, each said circular image having a common diameter D, and wherein the center of each said circular image is equidistantly spaced from the centers of adjacent circular images thereto by a distance S that is greater than the common diameter D, and wherein each of said circular images is entirely shaded in a primary direction by a printed graduated dot pattern, such that each image provides an illusion on the surface of said substrate material of a three-dimensional shadowed golf ball dimple.